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THE

DISEASES OF MEMORY

BY

TH. RIBOT

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THE DISEASES OF MEMORY.

BY TH. RIBOT,

AUTHOR OF "HEREDITY;" "ENGLISH PSYCHOLOGY," ETC.

TRANSLATED FROM THE FRENCH BY J. FITZGERALD, A. M.

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PREFACE.

My purpose in this work has been to present a psychological monograph of the diseases of memory, and, so far as the state of our knowledge permits, to deduce therefrom a few conclusions. The memory has often been studied, but hardly on its pathological side; and it has seemed to me that it might be profitable to view the subject under that aspect. I have endeavored to restrict myself to that, and have spoken of normal memory only so far as was necessary for clearness.

I have cited many facts, and in this respect my method is not the literary one; but I hold it to be the only one for conveying instruction. To describe in general terms the disordered states of the memory, without giving instances of each, appears to me to be labor thrown away, because it is important that the author's conclusions be capable of verification at every step. I beg the reader to note that what is offered to him here is an essay in descriptive psychology, *i. e.*, a chapter in natural history, and nothing more; and that, if it possesses no other merit, this little volume will acquaint him with a mass of curious observations and cases scattered through all sorts of compilations, and now for the first time collected together.

January, 1881. T. R

CHAPTER I.

MEMORY AS A BIOLOGICAL FACT.

Memory essentially a biological fact, incidentally a psychic fact—Organic memory—Modifications of nerve-elements; dynamic associations between these elements—Conscious memory—Conditions of consciousness: intensity; duration—Unconscious cerebration—Nerve action is the fundamental condition of memory; consciousness is only an accessory—Localization in the past, or recollection—Mechanism of this operation—It is not a simple and instantaneous act; it consists of the addition of secondary states of consciousness to the principal state of consciousness—Memory is a vision in time—Localization, theoretical and practical—Reference points—Resemblance and difference between localization in the future and in the past—All memory an illusion—Forgetfulness a condition of memory—Return to the starting point: conscious memory tends little by little to become automatic.

The descriptive study of memory has been very well performed by divers authors, especially by the Scotch, and hence it is not designed to revert to it. I propose to inquire what we may learn from the new method in psychology as to the nature of memory; to

show that the teachings of psychology combined with those of consciousness lead us to state this problem much more broadly; to prove that memory, as popularly understood, and as usually described by psychologists, so far from being memory in its entirety, is only one particular phase of it, though the highest and most complex, and that this, taken by itself and studied apart, cannot be fully understood; that it is the final term of a long evolution and, as it were, an efflorescence, whose root is found far back in organic life: in short, that memory is essentially a biological fact, and only by accident a fact of psychology.

Thus understood, our study involves a general physiology and psychology of memory, and at the same time its pathology. The disorders and diseases of this faculty, when classified and interpreted, are no longer an assemblage of curious facts and amusing anecdotes to be mentioned only incidentally: on the contrary, they are seen to be subject to certain laws which constitute the very groundwork of memory and which reveal its mechanism.

I.

In the common acceptation of the word, memory includes three things, viz.: the retention of certain states; their reproduction; their localization in the past. This, however, is only one kind of memory, and it may be designated *perfect*. These three elements are of unequal value: the first two are necessary, indispensable; the third, that which, in the language of the schools, is called "recollection," gives completeness to memory, but does not constitute it. Do away with the first two, and memory is abolished: suppress the third, and memory ceases to exist for itself, without ceasing to exist in itself. Hence this third element, which is purely psychological, appears as superadded to the others: they are permanent; it is instable, appearing and disappearing; it represents what consciousness may claim as its own in the fact of memory, and nothing more.

If we study memory as it has been studied down to our time, as a "faculty of the soul," with the aid of the *sensus intimus* (consciousness) alone, we must of necessity recognize in this perfect and conscious phase all that there is in memory; nevertheless that were, under the influence of a faulty method, to take a part for the whole, or rather the species for the genus. Some authors of our day—Huxley, Clifford, Maudsley, and others,—by maintaining that consciousness is only the accompaniment of some nervous processes, and that it is as incapable of reacting upon them as is a shadow of reacting on the footsteps of the wayfarer that it accompanies, have opened the way for the new theory which is here essayed. Let us set aside for the moment the psychic element, which will be considered later; let us reduce the problem to its simplest terms, and see how, quite apart from consciousness, a new state is implanted in the organism, how it is retained, and how reproduced: in other words, how, apart from consciousness, a fact of memory has its rise.

Before we come to organic memory itself, we must note certain phenomena that have sometimes been compared to it. Authors have found analogues of memory in the inorganic world, and particularly "in the property possessed by light-vibrations, whereby they may be stored up on a sheet of paper, and there persist, for a longer or shorter time, in the state of latent vibrations, ready to reappear at the summons of a developing agent. Engravings exposed to the sun's rays and then kept in a dark place, can months afterward, by the aid of appropriate reagents, reveal persistent traces of the photographic action of the sun upon their surface."* Lay a key upon a sheet of white paper, and expose the two to the direct rays of the sun; then lay the paper away in a drawer, and years afterward the spectral image of the key will be visible.† In our opinion these and other like facts bear too remote an analogy to memory to merit being cited. In them we find the first condition of all recollection, namely, the retention of the impression, but that is all we find, for here the reproduction of the impression is in such a degree passive, and dependent on the intervention of an outside agency, that it bears no resemblance to the natural reproduction of memory. Furthermore, with regard to the matter before us, we must never forget that we have to do with the laws of life, not with physical laws, and that the foundations of memory must be sought in the properties of organized matter and not elsewhere. It will be seen later that they who overlook this fall into errors.

Neither will I dwell upon certain habits of plants, that have been compared to memory: I hasten to deal with facts of a more decisive character.‡

In the animal kingdom muscle tissue roughly illustrates the acquisition of new properties, their retention and their automatic reproduction. "Daily experience," says Hering, "shows that a muscle becomes stronger the

* Luys, "The Brain and its Functions."

† G. H. Lewes, "Problems of Life and Mind." Third Series, p. 57.

‡ Two facts observed by the Translator may, perhaps, serve to illustrate the persistence of impressions through diversified physical changes. A mass of beeswax that had been employed again and again, melted and re-melted, in an electrotype foundry; which was all blackened with graphite, and had, apparently, lost forever the cell-structure of the honeycomb, was found to present on its surface, with great distinctness, the outlines of the polygonal cells. Again, a jar of raspberry conserve—the juice of the raspberry boiled, with the addition of sugar, presented the forms of the berries so distinctly that, with care, it was possible to separate one from the mass.

oftener it works. The muscle fiber which at first makes feeble response to the excitation transmitted by the motor nerve, responds more energetically the more frequently it is excited, pauses and rests being of course presupposed. After each action it is more fitted for action again, better prepared for the repetition of the same work, better adjusted for the reproduction of the organic process. It wins more by activity than by long repose. Here we have, in its simplest form,—in that which comes nearest to purely physical conditions—that faculty of reproduction which is found under so complex a form in nerve substance. And what we see in muscular tissue we see in greater or less degree in the substance of the other organs. We everywhere observe that an enhanced functional power of organs accompanies an increase of activity, with sufficient intervals of rest."*

The most highly developed tissue of the organism, nerve tissue, presents in the highest degree this two-fold property of retention and reproduction. Still, we will not seek in the most simple form of its activity, reflex action, the type of organic memory. Reflex action, indeed, whether it consists of an excitation followed by one contraction or by many, is a result of an anatomical arrangement. And it might be asserted, not without probability, that this anatomical arrangement, now innate in animals, is the product of heredity, that is to say, of a specific memory; that some time it was acquired, and then became fixed and organic through innumerable repetitions. We will not employ this argument in favor of our thesis, for there are many others far less open to question.

The true type of organic memory—and here we come to the very core of our subject—must be sought in that group of phenomena which Hartley so well named *secondary automatic actions*, as opposed to primary or innate automatic acts. These secondary automatic actions, or acquired movements, are the very groundwork of our daily life. Thus, locomotion, which in many lower species is an innate property, in Man has to be acquired—especially that power of coördination which maintains the body's equilibrium at each step we take, by combining tactual impressions with visual. It may be generally affirmed that in an adult the members and the sensorial organs act so freely as they do, only because of the sum of acquired and coördinated movements which constitute for each separate part of the body its special memory—the accumulated capital on which it lives, and by which it acts, just as the mind lives and acts by reason of its past experiences. To the same class belong those groups of movements of a more artificial character, which constitute the apprenticeship of all manual trades, games of skill, various bodily exercises, etc.

If we inquire how these primary automatic movements are acquired, fixed and reproduced, we see that the first step consists in forming associations. The raw material, so to speak, is supplied by the primary reflex actions; these are to be grouped in a certain way, and some combined together, to the exclusion of others. Sometimes this period of formation is simply a long continued experimentation. Acts which now seem to us to be entirely natural, were originally acquired by most laborious effort. When the babe's eyes for the first time see the light, we notice an incoherent fluctuation of movements; a few weeks later coördination of the movements is effected, and the eyes can adjust themselves, can locate a luminous point, and follow its every movement. When a child is learning to write, observes Lewes, he cannot move the hand by itself, but must also move the tongue, the muscles of the face and even those of the feet.* But in time he learns to suppress these useless movements. Any one, on essaying for the first time any muscular act, expends a large amount of superfluous energy, which he afterward by degrees learns to restrict to what is simply necessary. The appropriate motions become fixed by exercise, to the exclusion of the others. There are formed in the nerve elements corresponding to the motor organs, secondary dynamic associations more or less stable (that is to say, a memory), and these are added to the primarv and permanent anatomical associations.

If the reader will observe for a moment these secondary automatic actions, which are very numerous and fall under the cognizance of every one, he will see that this organic memory is like psychological memory in all respects, save one, viz., the absence of consciousness. If we sum up the characteristics of organic memory, the perfect resemblance between the two memories will clearly appear:

Acquisition, now instantaneous; again slow. Repetition of the act in some cases necessary, in others of no use. Inequality of organic memory in different persons: in some quick, in others slow or altogether refractory: awkwardness is the result of defective organic memory. In some persons there is permanence of associations that have once been formed: in others these are readily lost, forgotten. Arrangement of these acts in simultaneous or in successive series, just as in the case of conscious memory. A fact worthy of note in this connection is that each member of a series *suggests* the next following: this is what occurs when we walk without reflecting on the act. Soldiers on foot, and even horsemen in the saddle, overcome by sleep, have been able to keep on the march,

* Hering, "Ueber das Gedächtniss als allgemeine Function der organisirten Materie." 2e. Auflage. Wien: Gerold's Sohn, 1876, p. 13.

* Op. Cit. p. 51.

though the latter have continually to preserve their equilibrium. This organic suggestion is exhibited more strikingly still in the case mentioned by Dr. Carpenter* of an accomplished pianist, who executed a piece of music while asleep—a feat which we must credit less to the sense of hearing than to the muscular sense which suggested the succession of movements. But not to go in search of extraordinary cases, we find in our daily actions organic series, both complex and well-defined, that is, wherein the beginning and the end are fixed, and wherein the terms, all differing from one another, follow in a constant order, as in going up or down a stairway with which we are familiar. Our psychological memory takes no note of the number of steps; our organic memory notes it after its own fashion, as also the division by landings, the arrangement of the banisters and other details: it makes no mistake. May we not say that, for the organic memory, these well-defined series are strictly the analogues of a phrase, a couplet of verses, or an air in music for the psychological memory.

Thus, then, in its mode of acquiring, preserving and reproducing impressions we find organic memory identical with psychological. Consciousness alone is wanting. At first consciousness accompanied the motor activity, then it gradually disappeared. Sometimes—and such cases are the most instructive—the disappearance of consciousness is abrupt. A certain man subject to temporary suspense of consciousness would continue, while this condition lasted, any movement he might have begun. One day he walked straight into a body of water. Often—for he was a shoemaker—he would prick his fingers with his awl and go on with the movements of stabbing the awl through the leather.† In the epileptic vertigo called the "petit mal" such occurrences are of every day observation. A certain musician while playing the violin in an orchestra, was often seized with epileptic vertigo (momentary loss of consciousness) during the performance of a piece—"nevertheless he would keep on playing, and though absolutely unconscious of all around him, neither seeing nor hearing the musicians who accompanied him, he followed the measure."‡ It is as though consciousness were teaching us just what part it plays, and showing its real value, and by disappearing suddenly, were proving that in the mechanism of memory it is a superadded element.

We have now in logical sequence to advance further, and to inquire what modifications of the organism are required for the establishment of memory, what changes the nervous system undergoes when a group of movements is definitively organized. Here we come upon the last question that can be raised, without going beyond the region of facts, as to the organic bases of memory; and if organic memory is a property of animal life, whereof psychological memory is only a particular phase, whatever we shall discover or conjecture as to its ultimate conditions, will be applicable to memory in general.

It is impossible for us, in this inquiry, to forego resort to hypothesis. Still, by avoiding all *a priori* conceptions, by keeping close to facts, and taking our stand upon what is known in regard to nerve action, we escape all risk of serious error. Besides, the hypothesis we offer is capable of all sorts of modification. Finally, in lieu of a vague phrase touching the retention and reproduction of memory, it will substitute in our minds a distinct representation of the extremely complex process which produces and sustains it.

The first point to be established is that regarding the seat of memory. This question cannot now-a-days give occasion for any serious controversy. "We must regard it as well nigh demonstrated," says Bain, "that the renewed feeling occupies the very same parts and in the same manner, as the original feeling." To cite a striking example of this, experience shows that the persistent idea of a bright color fatigues the optic nerve. We know that the perception of a colored object is often followed by a consecutive sensation which presents the object with the same contours, but in a color complementary to the real color. The same may occur in regard to the idea (the recollection). That, too, leaves, though with a less degree of intensity, a consecutive image. If, with closed eyes, we keep for a length of time an image of very lively colors before the imagination, and then opening the eyes suddenly we fix them upon a white surface, we see thereon for an instant the image contemplated in imagination, but in the complementary color. This fact, as is observed by Wundt, from whom we borrow it, proves that the nerve action is the same in the two cases—in the sense-perception and in the memory.*

The number of facts and inductions that go to confirm this thesis is so great as to make it almost a certitude; and it would require weighty reasons indeed to refute it. In truth there is no such thing as memory but only memories; there is no one seat of memory, but special seats for each memory in particular. Memory is not, as the vague phrase of common speech has it, "in the soul;" it is fixed in its birth-place, in a part of the nervous system.

This premised, we begin to see our way more clearly through the problem of the physiological conditions of memory. These conditions we conceive to be as follows:

* "Mental Physiology," § 75.
† Carpenter, "Mental Physiology," p. 75.
‡ Trousseau, "Leçons Cliniques," vol. ii, xli, § 2. In the same passage are found many other facts of this kind. We will return to this subject when we come to treat of the pathology of memory.

* For further details upon this point, see Bain, "The Senses and the Intellect."

1. A special modification impressed upon the nerve-elements.

2. An association, a special connection established between a certain number of these elements.

Authors have not given to this second condition the importance it deserves, as we shall endeavor to show.

To confine ourselves for a moment to organic memory, let us take one of those secondary automatic movements which have served us as types, and consider what takes place during the period of organization—for instance, the movements of the legs in walking.

Each movement requires the play of a certain number of muscles, superficial or deep-seated; of tendons, joints, ligaments, etc. These modifications—at least most of them—are transmitted to the sensorium. Whatever opinion one may hold upon the anatomical conditions of muscular sensibility, certain it is that it exists; that it tells us what part of the body is concerned in a movement, and that it enables us to regulate this movement.

Now what does this imply? It implies modifications received and retained by a determinate group of nerve-elements. "The movements that are instigated or actuated by a particular nervous center do, like the idea, leave behind them residua, which, after several repetitions, become so completely organized into the nature of the nervous center that the movements may henceforth be automatic."* "The residua of volitions, like the residua of sensations or ideas, remain in the mind and render future volitions of a like kind, more easy and more definite."† It is this organization of the "residua" which, after the period of experimentation already mentioned, enables us to perform movements with more and more ease and precision, till at last they become automatic.

In subjecting to analysis this very familiar instance of organic memory, we see that it implies the two conditions mentioned above.

The first condition is a special modification impressed upon the nerve-elements. As this has oftentimes been explained before, we shall not dwell long upon it. In the first place, the nerve-filament being *ex hypothesi* impressionless, does it, upon receiving an entirely new impression, retain a permanent modification? This is a moot point. Some authors see in the nerves a simple conductor the constituent material of which, being for a moment disturbed by an impression, returns again to its original state of equilibrium. Whether we explain the transmission by vibrations propagated along the axis-cylinder, or by a chemical decomposition of its protoplasm, it is difficult to believe that nothing of it remains. But however that may be, we find at least in the nerve cell the element which, by general consent, receives, stores up and reacts. Now, an impression, once received, marks it with an imprint. Thereby, according to Maudsley, there is produced an aptitude and with it *differentiation* of the element, though we have no reason to suppose that originally that element differed from homologous nerve cells. "Every impression leaves a certain ineffaceable trace; that is to say, the molecules, once they are arranged otherwise and forced to vibrate in a different way, will not return exactly to their original state. If I brush the surface of still water with a feather, the liquid will not resume the form which it had before: it may again present a smooth surface, but molecules will have changed places, and a sufficiently penetrating eye would certainly discover therein evidence of the passage of the feather. Animal molecules that have been disarranged have thereby gained, in a greater or less degree, aptitude for undergoing disarrangement. Doubtless, if this same external agency does not again act anew upon the same molecules, they will tend to resume their own natural movement; but the case will be very different if they are again and again subjected to the same action. Then they will little by little lose the power of returning to their natural movement, and will become more and more identified with that which is impressed upon them, till at last it becomes natural to them in its turn, and they obey the slightest cause that will set them in vibration."*

It is impossible to define wherein this modification consists. Neither microscope nor reagents, neither histology nor histochemistry can throw light upon it; but facts and reason assure us that it exists.

The second condition, which consists in the establishment of stable associations between different groups of nerve-elements, has not hitherto attracted attention. I am not aware even that contemporary authors have recognized its importance; and yet it is a necessary consequence of their thesis upon the seat of memory.

Some of them appear to hold, implicitly at least, that a memory, either organic or conscious, is impressed upon a single cell which, with its nerve filaments, would seem to possess a sort of monopoly of retaining and reproducing it. What has contributed to keep up this illusion is, I conceive, the fashion of speech which requires us to look on a movement, a perception, a thought, an image, a sentiment, as *one* thing, as a *unit*. But reflection soon shows each of these supposed units to be made up of many and heterogeneous elements; that it is an association, a group, a fusion, a complex, a *multiplicity*. Take the example already cited—a locomotory movement. This may be regarded as a reflex action of great complexity, the initial

* Maudsley, "Physiology and Pathology of the Mind," p. 167.

† *Ibid*, p. 157.

* Delbœuf, "Théorie Générale de la Sensibilité," p. 60.

impression of which is the contact of the foot with the ground each moment.

Let us consider this movement at first in its complete form. Is the starting point a voluntary act? Then, according to Ferrier, the impulsion that has its rise in a particular region of the cortex of the brain, traverses the white substance, passes into the corpora striata, through the crura cerebri, the protuberance, the complex structure of the medulla; thence going over to the other side of the body, where it descends along the antero-lateral columns of the spinal cord to the lumbar region, and thence along the motor nerves to the muscles. This transmission is accompanied or followed by a return to the centers through the posterior columns of the cord and the gray matter, the medulla, the pons Varolii, the optic tract and the white matter to the cortex of the brain. Let us consider this movement in its abridged and most ordinary form—when it is automatic. In that case, according to the commonly received hypothesis, the transit proceeds only from the periphery to the cerebral ganglia and back again to the periphery, the superior brain not being involved in the movement.

This movement, the principal stages of which we have roughly indicated, and all the details of which are not yet thoroughly known, even to the most learned anatomists, implies the calling into action of nerve-elements very numerous, and very diverse. Thus, the motor and the sensory nerves differ in their histological structure from the nerves of the brain and the spinal cord. The cells differ in volume, in form (there being fusiform cells, giant cells, pyramidal cells, etc.), in the directions in which they lie, in the number of their filaments, in their position in the several parts of the cerebro-spinal axis, for they are distributed from the inferior extremity of the spinal cord to the cortical layers. All these elements play their respective parts in the concert of action. If the reader will glance at an anatomical chart, or at a few histological preparations, he will obtain an approximate idea of the enormous number of nerve-elements necessary to produce a movement, and consequently to retain and reproduce it.

We therefore hold it to be of the utmost importance to call attention to this point, viz., that organic memory supposes not only a modification of the nerve elements, but also the *establishment between them of associations adapted to each special action*—of certain *dynamic associations* which, by repetition become as stable as the primary anatomical connections. In our opinion the thing that is of importance, as supplying a basis for memory, is not only the modification impressed upon each element, but the way in which sundry elements are grouped together to form a complex.

As this point is for us of the first importance, we shall have no hesitation in dwelling upon it. First, it will be observed, that our hypothesis, which is a necessary corollary of admitted facts regarding the seat of memory, simplifies certain difficulties, though at first view it may appear to complicate them. The question is asked, can each nerve cell preserve many different modifications; or, once modified, is it polarized forever after? Of course we are reduced here to conjecture; yet we may without rashness suppose that though it may be capable of many modifications, the number of these must be limited. So, too, we may suppose that it preserves only one. The number of the brain cells being 600,000,000, according to the calculation made by Meynert (and Dr. Lionel Beale gives a very much higher number), the hypothesis of a single impression is in no wise inadmissible. But this question is of secondary interest for us, for even though we accept the latter hypothesis—the most unfavorable one for explaining the number and complexity of acts of organic memory—we should find that this single modification, being capable of entering into different combinations, may produce different results. We are to note not only each factor individually, but the relations of all the factors to one another, and the combinations thence resulting. The modified cell may be compared to a letter of the alphabet. This letter, while it continues to be the same, has concurred in forming millions of words in the living and dead languages. Combinations innumerable and of the highest complexity may result, through grouping, from a small number of elements.

To return to our instance of locomotion: The organic memory that serves as its basis consists of a special modification of a multitude of nerve elements. But several of these elements, thus modified, may subserve another purpose, may enter into other combinations, may take a part in other memories. The secondary automatic movements that constitute swimming or dancing presupposes certain modifications of the muscles, certain articulations already employed for locomotion, already registered in certain nerve elements; in short, they find a memory already organized, sundry elements of which they turn to their own advantage, causing them to enter into a new combination and to concur in forming another memory.

Further, we would observe, that the necessity of a great number of cells and nerve filaments for the retention and reproduction of a movement, though the same be a comparatively simple one, implies a greater possibility of permanence and reviviscence; in consequence of the number of the elements and of the solidarity established between them, the chances of reviviscence are increased, each one tending to call forth the others.

Finally, our hypothesis is in agreement with two facts of daily observation, viz.:

1. An acquired movement that is well fixed

in the organism, firmly *retained*, is displaced only with great difficulty by another, having nearly the same seat, but involving a different mechanism. In fact, one association has to be broken up to form another; established relations have to be annulled to set up new ones.

2. It sometimes happens that, in lieu of one accustomed movement, we involuntarily perform another; this is accounted for by the fact that as the same elements enter into different combinations capable of producing nerve-discharges in different directions, a trifling circumstance may suffice to call into activity one group instead of another, so producing different effects. Thus at least do we explain the following fact, reported by Lewes (Op. Cit., p. 128): "I was one day relating a visit to the Epileptic Hospital, and, intending to name the friend, Dr. Bastian, who accompanied me, I said, 'Dr. Brinton,' then immediately corrected this with 'Dr. Bridges;' this also was rejected, and 'Dr. Bastian' was pronounced. I was under no confusion whatever as to the persons, but, having imperfectly adjusted the group of muscles necessary for the articulation of the one name, the one element which was common to that group and to the others, namely, B, served to recall all three." The explanation seems entirely correct, and we may note with the author another familiar fact which favors our theory: "Who does not know," says Lewes, "how, in trying to recollect a name, we are tormented with the sense of its beginning with a certain letter, and how, by keeping this letter constantly before the the mind, at last the whole group emerges." A like observation may be made with regard to the acquired movements that constitute the act of writing. It is a mistake I have often found myself falling into, especially when writing rapidly and with a wearied brain; it is so trifling, so quickly corrected and so quickly forgotten, that I have had to make a note of it at the moment. Here are some instances: Intending to write the words "*doit de bonnes*," I wrote "*donne*." Intending to write "*ne* pas *faire une part*," I wrote "*ne* part *faire*," etc. Evidently, in the first case the letter D, and in the second the letter P (and by letter I mean the psycho-physiological state which serves as the basis for their conception and graphic representation), called forth one group instead of another; and this confusion was all the easier as the remainder of the groups, "*onne*" and "*art*," were already in the consciousness. Doubtless any one who will take the trouble of observing his own practice in these respects will admit that such errors are of frequent occurrence.

What has been said is hypothetical, but the hypothesis appears to be in agreement with scientific data, and to account for the facts. It enables us to contemplate in pretty definite shape the bases of organic memory, of those acquired movements which constitute the memory of our several organs—our eyes, our hands, our members. These bases do not, in our opinion, consist in a purely mechanical registration, nor, as the usual comparison would have it, in an impress preserved we know not where, like the image of the key already mentioned. These are similes borrowed from the world of physics and are out of place here. Memory is a biological fact. A rich and well-stored memory is not a collection of impressions, but an assemblage of dynamic associations, very stable and very readily called forth.

II.

We are now to study a more complex form of memory, that which is accompanied by consciousness, and which in ordinary language, and even in the language of psychologists is regarded as the sum total of memory. We have to inquire how far what has just been said of organic memory applies to this, and what is added by consciousness.

In passing from the simple to the complex, from the lower to the higher, from a stable form of memory to an instable one, we must not overlook the preliminary question of the relation between the unconscious and consciousness. So involved is this problem in its native obscurity and in artificial mysticism, that it seems difficult to say anything clear and decisive about it; but we shall try.

Of course we have nothing to do with the metaphysics of the unconscious, as understood by Hartmann and others; we shall even begin by confessing that we know not how to explain the transition from the unconscious to consciousness. One may offer ingenious, plausible hypotheses upon the subject, but nothing more. However, psychology, as a science of facts does not need to concern itself with these points; it takes consciousness for granted, without caring for its genesis; all that it can do is to determine a few of its conditions of existence.

The first of these is the mode of action of the nervous system, called by physiologists nervous discharge. But most nerve states do not awaken consciousness at all, or but rarely, and in an indirect way: for instance, the excitations and discharges whose seat is the great sympathetic; the normal action of the vaso-motor nerves; a great many reflex actions, etc. Others are accompanied by consciousness intermittently; or, though they are conscious in the early period of life, they cease to be so in the adult; instance the secondary automatic actions already mentioned. Nerve action is far more widely distributed than psychic activity: all psychic acts involve nerve action, but the proposition is not reciprocally true. Between the nerve activity that is never, or hardly ever, accompanied by consciousness, and the nerve activity that is always, or nearly always, so accompanied, stands that which sometimes

has for its concomitant consciousness. It is in this group of facts that the unconscious must be studied.

Before we arrive at clearer and better-grounded conclusions on this subject, we would note two other conditions of consciousness, viz., intensity and duration.

1. Intensity is a condition of highly variable character. Our states of consciousness are ever striving to supplant one another, but victory may result equally either from the superior strength of the victor or from the weakness of the other contestants. We know—and this point has been very well elucidated by the school of Herbart—that the most vivid state of consciousness may grow steadily fainter till at last it falls below the level of consciousness, in other words, till one of its conditions of existence fails. We are justified in affirming for consciousness all possible degrees down to the lowest, to the state called by Maudsley sub-conscious; but there is no warrant for maintaining that this descending scale has no end, though we may not discern it.

2. *Duration*, as a necessary condition of consciousness, has not received much attention; yet it is of the first importance. On this point we can reason from definite data. The researches of the last thirty years have determined the time that is required for the different sense-perceptions, (hearing 0.16 to 0.14 sec., touch, 0.21 to 0.18 sec., sight, 0.20 to 0.22 sec., and for the simplest act of discernment, that nearest to reflex action 0.02 to 0.04 sec.). Though the results vary according to the experimenter, the person under experiment, the circumstances and the nature of the psychical acts that are being investigated, so much is at least established, viz., that every psychical act requires an appreciable duration, and that the supposed infinite rapidity of thought is only a figure of speech. From this it follows that no nervous action, the duration of which is less than that required by psychic action, can awaken consciousness. An instructive comparison may be made between the nervous act accompanied by consciousness, and simple reflex action. According to Exner* the time necessary for a reflex action is 0.0662 to 0.0578 sec., which is much less than that stated above for the different sense-perceptions. If, as Herbert Spencer observes, the wing of a gnat makes from ten to fifteen thousand beats in a second, each involving a separate nervous act, we have nerve action of astounding rapidity, compared with which nervous acts accompanied by consciousness occupy an enormous length of time. From all this it follows that since every act of consciousness necessarily requires a certain duration, one essential condition of consciousness is wanting whenever the duration of a nervous process falls short of that minimum.*

The question of the unconscious is obscure and beset with contradictory opinions, simply because it is incorrectly stated. If we look on consciousness as an entity, as a fundamental attribute of the soul, all becomes obscure; if we consider it as a phenomenon having its own conditions of existence, all becomes clear, and the unconscious is no longer a mystery. We must never forget that a state of consciousness is a complex fact which supposes a special state of the nervous system; that this nervous action *is not a mere accessory but an integral part* of the fact; that it is its base, its fundamental condition; that given the nervous action the fact exists *in* itself; that, consciousness being added, the fact exists *for* itself; that consciousness completes it, perfects it, but does not constitute it. If one of the conditions of consciousness be wanting, as intensity, or duration, or any other unknown to us, then a part of the complex whole—consciousness—disappears; but another part—the nervous process—remains. All that is left of the fact is its purely organic phase. It is not surprising, therefore, if later the results of this cerebral activity turn up; such activity there was, though it was not noted.

Regarded from this point of view, the whole subject of unconscious action loses its mysterious character, and is readily explained, for example, the sudden in-rush of recollections, apparently called up by no association, that occurs daily to every one; the lessons read by a schoolboy at night, known by heart in the morning; problems long studied, the solution of which bursts suddenly on the consciousness; poetical, scientific, and mechanical inventions; secret sympathies, etc. Unconscious cerebration does its work noiselessly, and reduces obscure ideas to order. In a curious case mentioned by Carpenter,† a

* Pflüger's "Archiv," viii (1874), p. 526. The duration of reflex actions varies according to the force of the stimulus, and the direction of the transmission, whether longitudinal or transverse, in the spinal cord. But this question is by no means cleared up.

* The researches as to the duration of psychic acts may throw new light upon certain facts of our mental life. Thus they help, I think, to explain the transition from the conscious to the unconscious in habits. An act is at first performed slowly, consciously: by repetition it becomes easier and is executed more rapidly, *i. e.*, the nervous process which is its basis, finding its course fully traced for it, takes place rapidly and by degrees falls below the minimum duration required for consciousness.

† "Mental Physiology," p. 533. The whole chapter xiii contains interesting facts about unconscious cerebration. A mathematician, a friend of the author, had been occupied with a geometrical problem, and had had a glimpse of the solution. He reverted to it again and again without success. Many years afterward the solution occurred to him so suddenly that he "trembled as if in the presence of another being who had communicated the secret." If any one would witness the spectacle of a powerful and penetrating mind hampered by a faulty method, he must read Sir William Hamilton's remarkable study of "Latency," ("Metaphysics," vol. i, lect. xviii). With his theory of the faculties of the soul, and his willful disregard of all physiology, he is unable to escape from any difficulty.

man was vaguely cognizant of the work going on in his brain, without having distinct consciousness. "A business man in Boston having an important question under consideration, had given it up for the time as too much for him But he was conscious of an action going on in his brain which was so unusual and painful as to excite his apprehensions that he was threatened with palsy, or something of that sort. After some hours of this uneasiness, his perplexity was all at once cleared up by the natural solution of his doubts coming to him—worked out, as he believed, in that obscure and troubled interval."

To sum up, we may regard the nervous system as being traversed by continuous discharges. Of these nervous actions some answer to the incessant rhythm of the vital activities; others, much fewer in number, to the succession of states of consciousness; still others, and these are by far more numerous, constitute unconscious cerebration. The six hundred (or the twelve hundred) million cells, and the four thousand or five thousand millions of fibers, even allowing for those which are inactive or remain during the whole period of life without occupation, offer a considerable contingent of active elements. The brain is a sort of busy workshop where ten thousand different operations are going on at once. Unconscious cerebration not being subject to the conditions of time, and taking place so to speak only in space, may act in different places simultaneously. Consciousness is the narrow wicket through which a very small portion of all this work becomes visible to us.

We now see wherein consists the relation of consciousness to the unconscious, and by that very fact we have a definite idea of the relation of psychic to organic memory: the former is only one phase of the latter. In a general sense, what has been said of physiological memory applies to conscious memory: there is simply the addition of one factor. Still it will be of advantage to consider the question anew, and in detail. Here again we have to examine two things, namely the residua and the groups they form.

I. The old theories of memory, as they contemplated only its psychological aspects, assigned for its only basis "vestiges," "traces," "residua," and often erred in employing these terms in an ambiguous sense, signifying now material impresses on the brain, again latent modifications retained in the "soul." Those who adopted the latter opinion were logical. But this theory, though it numbers many partisans among those who stand aloof from physiology, is untenable. A state of consciousness that is not conscious, a representation that is not represented, is simply a form of speech, and nothing more. To eliminate from a thing that which constitutes it what it is, is to reduce it to a simple possibility; that is to say, when the conditions in which it exists reappear, the thing will reappear too. And this brings us back to what was said above with regard to the unconscious.

For us, the question of "psychological residua" is settled beforehand; for if every state of consciousness implies as an integral part of itself nerve action, and if this nerve action modifies the nerve centers in a permanent way then the state of consciousness too is recorded in those centers. True, it may be objected that a state of consciousness implies nerve action and *something more*. That makes little difference. If the original nervous state—perception—sufficed to call up this something more, the secondary nervous state — recollection — equally suffices. The conditions are the same in the two cases; and the solution of this difficulty, if solution there be, is incumbent on a theory of perception, not on a theory of memory.

We may with Wundt call this psychophysiological residuum an arrangement, and with him point out wherein it differs from an impress. "Certain analogies taken from the domain of physiology bring out this difference clearly. In the eye that has been exposed to intense light the impression received persists in the shape of a consecutive image. The eye which daily compares and measures distances and relative positions in space becomes more and more exact. The consecutive image is an impress: the accommodation of the eye, its power of measuring distances, is a functional arrangement. The retina and the muscles may be formed in the unpracticed eye just as they are in the practiced, but there is in the latter a far more marked anatomical arrangement than in the former. No doubt we may say that physiological use and want of organs depends less upon their changes properly so-called than on the impresses that persist in their nervous centers; but all physiological researches into the phenomena of habit, of adaptation to conditions, etc., show that here too impresses consist essentially of functional arrangements."

II. These considerations bring us to the point upon which we desire to lay stress. The dynamic associations of the nerve elements play a still more important part in conscious memory than in organic memory. We might repeat what has been said above; but this side of the question has been so little studied that it is best to consider it again under another form.

Every one finds in his consciousness a number of recollections: of men, animals, cities, landscapes; facts of science, of history, of language, etc. These recollections recur to us in the shape of series, longer or shorter. The formation of these series has been very well explained by the laws of association between states of consciousness, and to that

* "Grundzüge der Philosophischen Psychologie," p. 791.

explanation we have nothing to add. What interests us is, not the series but the terms of which they are composed. We want to get at the simple state of consciousness, in order to show what complexity it involves.

Let us take then one of these terms—the recollection of an apple, for instance. If we are to believe the dictum of consciousness, this is a very simple fact, but physiology shows this to be an error. The recollection of an apple is necessarily the weakened form of the perception of an apple. What does this perception imply? A modification of the retina, which is the nerve terminus of a highly complex structure; transmission through the optic nerve, and the corpora geniculata to the tubercula quadrigemina; thence to the cerebral ganglia (optic tract?); through the white matter to the cortex. This involves the calling into action of many different elements, lying along an extended route. Yet this is not all. It is not a question of a mere color-sensation. We see, or think we see the apple as a solid object of spherical form. These judgments result from the exquisite muscular sensibility of our visual organ and from its movements. But the movements of the eye are governed by sundry nerves, as the sympathetic, the oculo-motor communis and the oculo-motor externus. Each of these nerves terminates at a particular point in the medulla, which is itself connected with the cortex of the brain where originate what Maudsley calls the motor intuitions. We give only the outlines; for details the reader may consult anatomical and physiological treatises. Thus an idea may be formed of the enormous number of nerve filaments and nerve cells scattered in groups through the different parts of the cerebro-spinal axis, that serve as a basis for the psychic state—the recollection of an apple—which by the twofold illusion of language and consciousness we are led to regard as so simple.

It will, perhaps, be objected that a visual perception is highly complex, and proves too much in favor of our thesis. Take, then, the recollection of a word. If it be a written word, the recollection is visual, and the case is analogous to the preceding. But if it be a spoken word, the complexity is equally great. Articulate language presupposes the cooperation of the larynx, the pharynx, the mouth, the nasal passages, and consequently of several nerves having their centers in divers parts of the medulla, viz.: the spinal, facial and hypoglossal nerves. And if you assign to auditive impressions a place in the recollection of words, the complexity is still greater. Finally, the medullary center must itself be connected with Broca's convolution and the region of the insula, both of which are universally regarded as the psychic center of speech. It is seen that this case differs neither in kind nor in the degree of its complexity from the preceding, and that the recollection of each separate word must have for its basis a definite association of nerve elements.*

There is no need to dwell upon this point: from what has been said we see the importance of those associations which I shall call the *dynamic bases* of memory, the modifications impressed upon the elements being the static bases. It will, perhaps, be said that our examples suppose cases simpler still: true, but we need not concern ourselves with them. What memory preserves and reproduces, is concrete actual states of consciousness; we had, therefore, to regard them as such, and to select instances from that order of facts. Physiological analysis and ideological analysis, descending, each from its own side, to the ultimate elements, are of service in explaining the genesis of states of consciousness: but here we consider them as formed. When we are learning to talk, we employ a few simple words: later, we make use of a few phrases. For a long time we know not that these words imply elements simpler still: many men never know it. Now consciousness, which is an inner speech, acts in the same way: that which for it is simple, analysis shows to be complex. But no doubt the simple states that are the alphabet of consciousness, themselves presuppose, for their retention and their reproduction, certain complexes of nerves. The examples already cited with regard to letters and syllables prove this. A still more curious one is cited by Dr. Forbes Winslow: A well-educated man, after an attack of fever and ague, lost all the knowledge of the letter F.†

Hence if we would portray to ourselves a good memory and translate that expression into the language of physiology, we should have to picture to ourselves a great many nerve elements, each modified in its own way, each taking part in an association, and, perhaps, adapted to enter into many associations, each association comprising the conditions of states of consciousness. The memory thus has static bases and dynamic bases. Its power is in proportion to the number of these and their stability.

III.

We are now to study the special character of the psychic memory, that which is peculiarly its own, and which, while making no change in its nature or its organic conditions, constitutes it the highest, the most complex, and the most instable form of memory. This character is, in the language

* Forbes Winslow, "On the Obscure Diseases of the Brain," 4th edition, p. 257, mentions the case of a soldier who, having undergone the operation of trephining, lost a portion of his brain. Some time afterward it was noticed that he had forgotten the numbers *five* and *seven*, and those only. After a time he recoverrd his memory of these two numbers.

† *Op. cit.* p. 258. The author does not tell us whether it was the articulation or the graphic sign, or both, nor whether the patient recovered.

of the schools, called recollection. I shall call it Localization in Time, that term implying no hypothesis and being simply the expression of the facts.

There are few questions that the method of "mental faculties" has so perplexed with difficulties and with far-fetched explanations as this. It will, therefore, be well at the outset briefly to indicate how, from our point of view, the question is stated and how it is settled.

Localization in time (for example the recollection that such or such an accident befell us at such a time and in such a place) is not a primary act. It supposes, in addition to the principal state of consciousness, secondary ones varying in number and degree which, being grouped around it, determine it. Perhaps the mechanism of "recollection" is best explained by the mechanism of vision.

The distinction between primary and acquired visual perceptions has been recognized ever since Berkeley's time. We know that the primary datum of the sensation of sight is a colored surface; that the secondary data are direction, distance, form, etc.; that the former is dependent above all on the sensibility of the retina, while the latter depend mainly on the muscular sensibility of the eye; that by force of habit the primary and acquired have become so blended together that they seem to constitute one simple ultimate act, though the opposite is proved by analysis, by experiment and by divers pathological cases. So with regard to memory. The primary state of consciousness is originally given as simply existent: the secondary states of consciousness superadded to it, and which consist of relations and judgments, localize it at a certain distance in time, so that memory may be defined *seeing in time*.

This operation which, for clearness' sake we have thus roughly described, must now be studied more closely and in detail.

The theoretical explanation of localization in time starts from the law formulated by Dugald Stewart, and so well explained by Taine,* that the acts of the imagination are always accompanied by a belief, at least momentary, in the actual existence of the object to which they relate. This belief, which is most pronounced in hallucination, in vertigo and in dreaming (because there are no actual perceptions to correct it) exists, though in a less degree, with respect to all states of consciousness whatever. I say nothing here of the mechanism by which the state of consciousness is stripped of its objective reality and reduced to a simple conception of the mind. On this point I refer the reader to the explanations offered by Taine.†

Still this is not a recollection. So long as an image, whatever it may stand for—a house, a mechanical invention, or a feeling—remains isolated, and, as it were, suspended in the consciousness, having no relation to other states that for us have a fixed place, and not being localizable by us—we see therein only an actual state of consciousness. But among such images there are some that possess the property, so soon as they enter the consciousness, of ramifying in different directions, of reawakening states of consciousness that connect them with the present, and thus they occur to us as forming a part of a longer or shorter series terminating in the present. In other words, they are localized in time.

I shall not inquire whether it is memory that makes the idea of time possible, or whether it is the idea of time that makes memory possible; neither shall I discuss the question whether time be an *a priori* form of the mind, nor whether memory be explicable by an empiric genesis. These questions have a place in a critique of knowledge, not in an empiric psychology, which has nothing to do with these critical or ontological discussions; it ascertains as a fact that time implies memory, and that memory implies time, and is content. This conceded, how do we localize in time?

Theoretically, only one course is open to us. We determine positions in time, as we do positions in space, by referring to a fixed point, and as regards time, this fixed point is the present moment. We may observe that this present moment is a real state, having its duration-quantity. Brief as it is, it is not, as the metaphors of ordinary language would have it, a flash, a nothing, an abstraction, like a mathematical point: it has a beginning and an ending. Further, its beginning does not appear to us as an absolute beginning: it is in contact with something with which it is continuous. When we read or hear a sentence, there remains at the utterance of the fifth word, for example, something of the fourth. Each state of consciousness is effaced only by degrees; it leaves a trail like what, in physiological optics, is called the consecutive image (after-sensation, *Nachempfindung*). Thus, then, the fourth and the fifth words are continuous —the end of one being in contact with the beginning of the other. This is the main point. There is a contiguity, not indefinite, meaning that *any* two ends are in contact, but such a contiguity that the *beginning* of the actual state of consciousness is in contact with the *ending* of the state that preceded it. This simple fact once clearly apprehended, we have the *theoretical* mechanism of localization in time, for it is plain that the retrograde movement may also be made from the fourth word to the third, and so on; and that each state of consciousness having its own duration-quantity, the number of states of consciousness thus traversed regressively, and their duration-quantities give the position of any given state relatively to the present

* "On Intelligence." In this work will be found a collection of facts which leave no doubt on this point.

† Op. Cit., particularly Part II, Book I, ch. ii.

moment—its distance in time. Such is the theoretical mechanism of localization; a retrogression which, starting from the present, traverses a longer or shorter series of terms.

Practically, we have recourse to simpler and more expeditious processes. We very rarely perform this retrogression through all of the intermediate terms of the series, seldom even through the greater part of them. We simplify the operation by the employment of reference points.

I take a familiar example to illustrate: On the 30th of November I am expecting a book I greatly need. It comes from a distance, and cannot arrive in less than twenty days from the time of ordering it. Did I order it early enough? After trying in many ways to fix the date, I remember that I ordered the book on the day before I set out on a little journey, and the date of that I can determine precisely as Sunday, November 9th. The recollection is now perfect. If we analyze this case, we shall see that the principal state of consciousness—ordering the book—was at first something referred indefinitely to the past. It calls up secondary states, and compared with these, it is seen to precede some, to be subsequent to others. "The image," says Taine, "glides to and fro on the line of the past; each of the phrases pronounced mentally has given it a new oscillation."* At last it finds its place; it is now fixed, known. In this illustration the recollection of the journey is what I call a reference point. By reference point I mean any occurrence, any state of consciousness whose position in time we know, *i. e.*, its distance with respect to the present moment, and which serves as a measure of other distances in time. These reference points are states of consciousness which, from their intensity, withstand oblivion better than others, or which from their complexity are adapted to call up many associations and to increase the chances of revivescence. They are not selected arbitrarily, but force themselves upon us. Their value is purely relative. They retain this character for a day, a week, a month; but then, not coming into use, they are forgotten. As a rule they are purely individual in character, though some of them are common to a family, to a small community, to a nation. If I am not mistaken, they constitute for each individual different series answering pretty closely to the different occurrences that make up his life—his daily occupations, family events, professional occupations, scientific researches, etc., these series being more numerous in proportion as the life of the individual is more diversified. These reference points are like milestones set up on highways which, starting from one point diverge in various directions. But they possess this peculiarity, that these series may, as it were, come into juxtaposition so as to be compared.

We have now to show how these reference points enable us to simplify the mechanism of localization. The event which we call a reference point, since, according to the hypothesis, it comes very often into consciousness, is very often compared to the present as regards its position in time—in other words, the states intermediate between the two and separating them, are called up with greater or less distinctness. The result is that the position of the reference point is, or seems to be (and we shall later see that every recollection implies an illusion) better and better known. By repetition this localization becomes immediate, instantaneous, automatic. It is like the forming of a habit. The intermediate points disappear, being of no use: the series is reduced to two terms, and these two terms suffice, because their distance from each other in time is known. Were it not for this *short cut*, the vast number of intermediate terms being disregarded, localization in time would be a very lengthy and difficult process, restricted within narrow limits. But by the aid of this, so soon as an image appears, its primary localization is instantaneous: it stands between two fixed points, namely, the present moment and some reference point. The operation is completed after a few trials, and is often laborious, and fruitless, and perhaps never precise.

If the reader will examine his own recollections, he will, I think, raise no serious objection to what has just been said. Further, he will observe how close is the resemblance between the process here employed, and that whereby we localize objects in space. In the latter case also we have reference points, short cuts, and distances fully ascertained, which we employ as units of measurement.

A few words may also be devoted, not without profit, to showing that localization in the future is effected by a similar process. Our knowledge of the future cannot be anything but a repetition of the past. Here I find only two categories of facts. They are either a mere reproduction of what has already occurred at similar epochs in the same places, under the same circumstances; or they consist of inductions, deductions and conclusions drawn from the past, but produced by the logical working of the mind. Outside of these two categories everything is possible, but everything is unknown.

Plainly the first of these classes of facts is the one that most closely resembles memory, for it involves simply the reproduction of what has been. Suppose a man has been wont every year to pass the month of September in a country house. In the depth of winter he sees it with its surroundings, its inmates, its daily routine. The image is at first indeterminate: it belongs equally to the past and to the future. First, it separates

*Taine, "On Intelligence," Part II, Book 1, ch. II, § vi. A good analysis of this mental operation is given by Taine.

itself from the present; then it glides past winter, spring and summer; at last it becomes localized. The course of the year, with its succession of seasons, holidays, changes of occupation, supplies reference points. This process differs from memory only in one respect, namely, that here we pass from the *terminal* limit of the present, to the *initial* limit of the following state: we do not proceed, as in recollecting, from the beginning of one state of consciousness to the ending of another, but from an ending to a beginning. In this unchanging order we traverse, theoretically, all the intermediate states of consciousness, but practically we traverse only a few landmarks. The process is accordingly the same as in memory, only it works in the reverse direction.

In short, setting aside verbal explanations, we find that "recollection" is no "faculty" at all but a fact, and that this fact is the result of a sum of conditions. Hence, "recollection"—localization in time—varies with these conditions through all possible grades. In the highest grade are the reference points; next below these are vivid, well defined recollections, referred to their place in time past almost as quickly; then those that involve some hesitation, and require an appreciable time; lower still, labored recollections that take definite shape only after effort and resort to stratagem; last of all come those cases where all effort fails, and our indecision is expressed in such phrases as, "It seems to me that I have seen this form;" "have I seen this in a dream?" One step further, and localization fails altogether: the image, stript of its defining circumstances possesses nothing by which it can be definitely referred to any fixed time. There are many examples of this last case and they are to be found where we should least expect them. From the effects of disease or of old age, celebrated authors sometimes forget their own writings. Linné, toward the close of his life, took pleasure in reading his own works, and would exclaim, as he read, forgetting that he was himself the author: "Beautiful! I wish I had written that." The like is told of Newton and the discovery of the differential calculus. Walter Scott as he grew old was subject to this kind of forgetfulness. One day a poem was read to him which gave him pleasure, and he asked who was the author. It was a canto from his "Pirate." Ballantyne, who was his secretary and who wrote his life, relates in minute detail how the greater part of "Ivanhoe" was dictated during a painful illness. It was completed and published before its author had quit his bed. He had no recollections of it beyond the central idea of the story, which had antedated his illness.

In a case cited by Forbes Winslow, the image seems to be just on the point of being recognized, localized, but it falls short: "The poet Rogers, when ninety years of age, was out driving with a lady. She inquired of him about another lady whom he could not recollect. He pulled the check-string and appealed to his servant. 'Do I know Lady M.?' The reply was 'Yes sir.' This was a painful moment to us both. Taking my hand, he said: 'Never mind, my dear. I am not yet compelled to stop the carriage and ask if I know you.'" *

A much more instructive instance is recorded by Macaulay in his essay on Wycherley. Wycherley's memory, says he, was, toward the end of his life, at once exceedingly strong and exceedingly weak. If anything was read to him in the evening he would awake the next morning, his mind full of the ideas and the expressions heard the night before. He would write them out in perfect good faith, not doubting that they were his own. Here the mechanism of memory is plainly cut in twain, and pathology gives us its analysis. Interpreting this case according to the principles stated above, we should say: the modification impressed upon the brain-cells persisted; the dynamic associations of the nervous elements remained stable; the state of consciousness attaching to each was awakened; these several states of consciousness were again associated and again formed into series (sentences or verses). But there the mental operations suddenly stopped. These series did not awaken any secondary state; they remained isolated, without any relation to the present, without anything to fix their place in time. They remained as mental images, and they appeared new, because no concomitant state impressed on them the stamp of the past.

So far is localization in time from being a simple, primary, instantaneous act, that very often it requires a measurable interval even for consciousness. Where it appears to be instantaneous its rapidity is a result of habit. The eye, too, judges of the distance of objects, and it is probable that for nascent memory, as for nascent vision, localization is never instantaneous.†

Thus then we have discovered in the highest form of memory only one new operation—localization in time. We have now in conclusion to show the relatively illusory character of this operation.

* Laycock, "Personal and Organic Memory;" Carpenter, op. cit., p. 444; Ballantyne, "Life of Walter Scott"; Spring, "Symptomatologie," vol. II, p. 530; Forbes Winslow, op. cit, p. 247

† Note also what happens when events are many times repeated. I have made the journey from Paris to Brest a hundred times. The impressions of all these journeys overlie each other in my mind, forming a confused mass; properly speaking they constitute one vague image. Among them all, the journeys that are associated with some important event, whether fortunate or unfortunate, alone occur to me as recollections: only those which awaken secondary states of consciousness are localized in the mind, are recognized. The reader will observe that our explanation of the mechanism of "recollections" agrees with that given in Taine's "Intelligence," Part 2, Book I, chap II, § 6.

As I write I have a very vivid recollection of a visit I made a year ago to an old castle in Bohemia. The visit lasted two hours. To-day I easily make it over again in imagination: I enter at the great doorway, I pass in due order through the courts, corridors, halls and chapels as they rise story above story: I see again their frescoes and their decorations just as they are; I make my way fairly through this labyrinth of an old castle down to the moment of leaving, but I am unable to fancy the duration of this imaginary visit as equal in length to the two hours this moment just elapsed. It seems much shorter, and the difference would be much greater if the two hours just past had been spent in another visit of the same kind, or in some agreeable company. If we declare the two periods to be of equal length we do so on the evidence of time-pieces and in disregard of the evidence of our consciousness.

Every recollection, however distinct, suffers an enormous amount of abridgement: this fact is indisputable and has no exceptions. Scientific experiments in very simple cases, where the chances of error are inconsiderable, confirm this law. Vierordt has proved that if we try to imagine fractions of a second of time, our idea of any given fraction is always too large: the reverse holds when there is question of several minutes or several hours. In order to study the duration of these small intervals, he had the beats of a metronome noted for some time by a person who was required afterward to repeat the beats with the same rapidity. In the repetition the interval between the beats was too long when the original interval was short, and too short when the original interval was long.*

In proportion to the complexity of the states of consciousness the error increases. And what adds to the difficulty is the fact that this does not take place according to any appreciable law. It cannot be said to be in proportion to the length of time that may have elapsed; indeed we may assert the contrary. If I were to represent the last ten years of my life by a line one meter in length, the year just past would occupy three or four tenths of that line; the fifth, which was crowded with events, would take two-tenths; the other eight would be compressed within the remainder.

The same illusion is seen in history. Some centuries appear longer than others, and if I am not mistaken, the period from our day back to the taking of Constantinople seems longer than the period from that event back to the first crusade, though the two periods are very nearly equal in length of time. This probably results from the fact that the former period is better known to us, and that in it our own recollections are involved.

As the present merges into the past, our states of consciousness disappear and are obliterated. Reviewed after the lapse of a few days, little or nothing of these remains; most of them have vanished into nothingness, never to be recalled, and they have taken with them the quantity of duration inherent in them; consequently an effacement of states of consciousness is an effacement of time. Now the "short cuts" processes already spoken of presuppose this effacement. If, in order to recollect something in the distant past we had to go over the whole series of terms between now and then, memory were impossible, owing to the length of time the operation would require.*

Thus we reach the paradoxical result that forgetfulness is a condition of memory. Were it not for our totally forgetting a vast number of states of consciousness and momentarily forgetting a great many, we could not recollect anything. Forgetfulness therefore is not, except in certain cases, a disease of memory, but rather one condition of its healthful action and of its life. In this we find a striking analogy with the two great vital processes. To live is to gain and to lose; life consists as much in the work that eliminates as in that which assimilates. Forgetfulness is elimination.

A second result (and this brings us back again to the functions of vision) is that our knowledge of the past is like a painting with perspective reaching far into the distance, at once deceptive and true, for its truth is based on illusion. If on an hypothesis that never will be realized we could compare our actual past as it was, set objectively before us, with the subjective representation of the same furnished to us by memory, we should see that this copy is constructed on a particular system of projection; each of us readily finds his bearings in this system, for it is of his own making.

IV.

Thus we have reached, step by step, the highest development of memory; we will now follow the inverse order and come again back to our starting-point. This return is necessary, in order to show a second time that memory is a process of organization in

*Vierordt, "Der Zeitsinn nach Versuchen," 36—111. H. Weber, "Tastsinn und Gemeingefühl," 87, has made analogous experiments on visual perceptions. See also "Handbuch der Physiologie" (1879), edited by Hermann, vol. II. part 2, p. 282.

*Abercrombie, in his "Intellectual Powers," mentions a circumstance which confirms what is here said: "The late Dr. Leyden was remarkable for his memory. I am informed, through a gentlemen who was intimately acquainted with him, that he could repeat correctly a long Act of Parliament, or any similar document, after having once read it. When he was, on one occasion, congratulated by a friend for his remarkable power in this respect, he replied that, instead of an advantage, it was often a source of great inconvenience. This he explained by saying that, when he wished to recollect any particular point, in anything which he had read, he could do it only by repeating to himself the whole *from the commencement* till he reached the point which he wished to recall."

varying degrees between two extreme limits, namely, a new state and organic registration.

There is no form of mental activity that bears witness more effectively in favor of the theory of evolution: from that point of view, and from that alone, can we understand the nature of memory; and it is seen that the study of memory must be not only a study in physiology, but also in morphology, *i. e.* a history of its transformations.

Let us then take up the question where we left it. A new mental acquisition more or less complex is revived for the first or for the second time. Such recollections are the most instable of the elements of memory—so instable that many of them vanish for good; such are most of the occurrences that happen to us daily and hourly. However clear, however intense, they have a minimum of organization. But every time they return to the mind, whether voluntarily or involuntarily, they gain in stability—their tendency to become organized grows stronger.

Below this group of fully conscious and unorganized recollections stands the group of conscious and semi-organized recollections; for example a language we are by degrees learning, a scientific theory or a handicraft that we have only half mastered. Here the strongly individual character of the first group disappears, and the recollection becomes more and more impersonal—becomes objective. The localization in time disappears, being useless. Here and there a few isolated terms carry with them personal impressions which localize them. I remember having learned such a German or English word in such a town, or under such circumstances. It is a *survival*, a mark of a prior state, an original impress. Little by little it is effaced, and the term assumes the same commonplace and impersonal character as all other terms.

This knowledge of a science, a language, a handicraft becomes more and more rooted. It retreats by degrees from the psychic sphere, and becomes more and more like an organic memory. Such, in the case of an adult person, is his memory of his mother tongue.

One step lower, and we come to memory completely organized and nearly unconscious, as seen in the clever musician, the skilled mechanic, the accomplished danseuse. Nevertheless, all this was once memory in the strict and ordinary sense of the word—fully conscious memory.

We may go lower still. The exercise of every one of our senses (of sight, of touch; in walking, etc.), presupposes a completely organized memory; but so incorporated is it in our nature that most persons never suspect it to be acquired. The same can be said of many of our habitual judgments. No one *remembers* that the object at which he is looking has an opposite side; or that a certain modification of the visual impression implies a certain distance; or that a certain motion of the legs will move him forward; or that the thing which he sees moving about is a live animal. It would be thought a misuse of language were any one to ask another whether he *remembered* that the sun shines, that fire burns, that iron is hard, and that ice is cold.* Nevertheless, all this, we repeat, was once memory in the strict sense, in a nascent intelligence.

It is not necessary to add that the foregoing is a purely ideal sketch, a schematism. It were vain to endeavor to define with precision the several stages of an evolution that proceeds by infinitesimal transitions varying according to the individual.

Can we go further still? We might. Below the composite reflex actions which represent organic memory in its lowest phase we have simple reflex actions. We may conceive the latter—which are the result of a congenital anatomical arrangement—as being themselves acquired and made fixed by innumerable experiences in the course of the evolution of species. Thus we should pass from the memory of the individual organism (*individual* memory) to heredity, which is the memory of the species (*specific* memory). It is enough to simply refer to this hypothesis.

In fine it is impossible to say where memory, whether psychic or organic, ends. That which we designate by the collective name, memory, comprises series exhibiting all degrees of organization, from the nascent to the perfect state. There is incessant transition from the stable to the instable; from the state of consciousness, where acquisition is precarious, to the organic state, where acquisition is assured. In consequence of this steady tendency toward organization, a degree of simplification and order is given to the contents of memory which makes a higher form of thought possible. But the tendency to organization, left to itself, without a check, would tend to the progressive annihilation of consciousness; would reduce man to an automaton.

Suppose—though the hypothesis is one that cannot be realized—suppose an adult human being placed in such conditions that he has no more new states of consciousness—no new sensations, ideas, concepts, sentiments, or desires: the different series of states of consciousness which constitute each form of psychic activity would at last become so well organized as to make him a hardly conscious automaton. Narrow minds that always move in the same ruts reduce this hypothesis to a reality in some degree. Restricted within a narrow sphere, they have very little contact with what is new and strange, and hence tend toward the state of perfect stability; they become mere machines; so far as the greater part of their life is concerned, consciousness is superfluous.

* Herbert Spencer, "Psychology," Part IV., ch. vi., § 192.

Having considered the subject in all its aspects, we revert to the proposition stated at the outset, viz.: conscious memory is only a special phase of biological memory. We may now, by recourse to another class of considerations, show once more that memory is subject to the fundamental conditions of life.

All forms of memory, from the highest to the lowest, have for their groundwork dynamic associations between the nerve elements, and special modifications of these elements, at least of the cells. These modifications, resulting from a first impression, are retained by no inert matter—they do not resemble the impress of a seal on wax. They are impressed upon living matter. Now all living tissues are ever in process of molecular renewal, nerve tissue more than any other, and in nerve tissue the grey substance more than the white, as is proved by the extraordinary abundance of bloodvessels pervading it. Now, since the modifications persist, it follows that the arrangement of the molecules of new-formed tissue must exactly reproduce the type of the effete molecules to which they succeed. Memory is directly dependent on *nutrition*.

But not only have these cells the property of self-nutrition: they also possess, at least during a portion of their life, the power of reproduction, and we shall later see how this fact accounts for certain cases of the re-establishment of memory. All physiologists hold this reproduction to be simply a form of nutrition: therefore the basis of memory is nutrition—the vital process *par excellence*.

For the present I will not dwell upon this point. After we have considered the disorders of memory, its exalted and its depressed states, its momentary suspension, its eclipse and sudden return, its progressive impairment, we may return to the question with advantage: the capital importance of nutrition will then be self evident. Hitherto we have been occupied with the preliminaries of our subject—memory in its healthy state; it is time to study it in the morbid state. The pathology of memory is the complement of its physiology; we shall see whether it lends confirmation to it.

CHAPTER II.

GENERAL AMNESIA.

Classification of the diseases of memory—Temporary amnesia—Epileptics—Forgetfulness of certain periods of life—Examples of re-education—Slow and sudden recoveries—Case of provisional memory—Periodical or intermittent amnesia—Formation of two memories, totally or partially distinct—Cases of hypnotism recorded by Macnish, Azam and Dufay—Progressive amnesia—Its importance; reveals the law which governs the destruction of memory—Law of regression; enunciation of this law—In what order memory fails—Counter-proof; it is reconstituted in inverse order—Confirmatory facts—Congenital amnesia—Extraordinary memory of some idiots.

Material for the study of the diseases of memory is found scattered through medical works, treatises on mental diseases, and the writings of divers psychologists. It may be brought together without overmuch labor, and then we have at hand a sufficient store of observations. The difficulty is to classify, to interpret, to draw conclusions as to the mechanism of memory. In this respect the facts gleaned are of very unequal worth; the most extraordinary ones are not the most instructive. The physicians to whom we are indebted for most of them have described them almost exclusively with reference to their own art. In their eyes a disorder of memory is but a symptom, and they note it as such; it is of use as a guide in diagnosis or prognosis. So with regard to classification; they content themselves with a reference of each case of amnesia to the morbid state whose effect it is—brain softening, hemorrhage, concussion, etc.

For our purpose, on the other hand, the diseases of memory must be studied in themselves as morbid psychic states which may enable us the better to understand the normal state. As for classification we must needs ground it upon likenesses and differences. The subject has not yet been sufficiently studied to attempt a natural classification, *i. e.*, by causes; I would therefore remark that the classification here offered is designed simply for the purpose of reducing to something like order a confused and heterogeneous mass of facts; that in many respects it is arbitrary, I am free to confess.

Disorders of memory may be restricted to one single class of recollections, all the rest remaining intact, at least apparently; these are *partial* disorders. Others, on the contrary, affect the entire memory in all its forms; cut the mental life in twain or break it up into many fragments; or destroy it utterly by agencies that work step by step: these are *general* disorders.

We thus recognize, in the first place, two great classes, the general and the partial diseases of memory. The former alone will be considered in this chapter. We propose to consider them under the following heads: 1. Temporary Amnesia; 2. Periodic Amnesia; 3. Progressive Amnesia, last curious of all, but most instructive; 4. Congenital Amnesia.

I.

Temporary amnesia usually comes suddenly and disappears in the same way. It lasts for a period of time that may vary from five minutes to years. The briefest and clearest cases, as also the most common, occur in epilepsy.

Physicians are not agreed either as to the nature, the seat or the causes of this disease. The problem does not belong to our subject, nor is it within our province. Suffice it to say that authors with one accord recognize three forms of the disease: "grand mal," "petit mal," and vertigo; that they regard these less as distinct varieties than as degrees of the same morbid state; finally, that the milder the disease in its external manifestation, the graver its effects on the mind. The fit is succeeded by mental derangement which may betray itself by oddities and absurd acts, or by crimes. All these acts possess a common character called by Hughlings Jackson *mental automatism*. They leave no recollection, save in rare cases, where a few faint traces of memory remain.

A patient while advising with his physician is seized with epileptic vertigo. He recovers immediately, but forgets that he paid the fee a moment before the attack.* A clerk finds himself seated at his desk, his thoughts slightly confused, but otherwise without ailment. He remembers having ordered dinner at a restaurant, but from that moment forward he has no recollection of anything. He goes back to the restaurant, and there learns that he has eaten dinner and paid the bill, and that he left for his office without appearing to be ill. In this instance memory was in abeyance for about three quarters of an hour. Another epileptic, seized with a fit in a shop, falls to the floor, rises again, and runs away leaving behind his hat and notebook. "I was found," said he "a quarter of a mile away; I inquired for my hat in all the shops, but I was unconscious of what I was doing, and did not come to myself again till ten minutes later, when I reached the railroad." Trousseau relates the case of a magistrate who, while attending a meeting of a learned society in the Hotel de Ville, Paris, went out bare-headed, walked as far as the Quai, and returned to his place to join in the discussions, without any recollection of what he had done.

Oftentimes the patient keeps on performing, during the period of automatism the acts in which he may have been engaged at the moment of the attack, or he comments upon something he may have been reading. Instances of this were given in the preceding chapter. Nothing is more common than unavailing attempts at suicide, but when the fit of epileptic vertigo has passed there is no recollection of them whatever. The same is true with regard to criminal attempts. A shoemaker seized with epileptic mania on his wedding day, killed his father-in-law by stabbing him with his knife. Coming to his senses a few days afterward, he had not the faintest suspicion of what he had done.

From these examples the reader may get a better understanding of the nature of epileptic amnesia than from any general description of it. A certain period of mental activity is as though it had never been. The epileptic knows of it only from the testimony of others, or from vague conjectures. Such is the fact. As for its psychological interpretation, there are two possible hypotheses.

Either (1) the period of mental automatism was unaccompanied by consciousness, and in that case the amnesia needs no explanation, for as nothing was produced, so nothing can be retained or reproduced; or (2) there was consciousness, but so faint that amnesia ensues. This second hypothesis I believe to be the true one in a great many instances.

In the first place, as a matter simply of reasoning, it is difficult to see how very complex acts adapted to different ends can be performed without some measure of consciousness at least intermittent. Be the force of habit as great as you please, it must for all that be remembered that it where uniformity of action exists consciousness tends to disappear; on the other hand, it tends to manifest itself wherever there is diversity of action.

But reasoning can give only possibilities; experience alone is decisive. Now there are facts which go to prove the existence of a certain measure of consciousness even in the exceedingly numerous cases where the epileptic retains no remembrance of his paroxysm. "Some epileptics, on being questioned abruptly and in a commanding tone, reply in a low and plaintive voice. When the attack has passed, they recollect neither what has been said to them nor what they have themselves answered. . . . A child, forced during an at tack to inhale ether or ammonia, the odor of which was to it unbearable, would angrily cry out, 'go away, go away!' When the fit was over, the patient had no recollection of these occurrences. . . . Sometimes epileptics contrive, after much effort, to recall sundry occurrences that took place during the paroxysms, particularly those of the last few moments of the seizure. . . . In that case they are in a situation comparable to that of one awakening out of a distressing dream. At first the main circumstances of the attack escape them, and they disclaim all knowledge of the acts imputed to them; but little by little they recall sundry details which at first they seemed to have forgotten."*

If in these cases circumstances go to prove that consciousness existed, it is not rash to assert its existence in many other cases. But I do not mean to assert that this holds for all cases. The magistrate mentioned above directed his steps with sufficient discretion to

* The facts here cited are taken for the most part from a memoir by Dr. H. Jackson, published in the *West Riding Asylum Review*, and from an article by Falret on the mental state of epileptics, in the *Archives de Médecine*, December, 1860, April and October, 1862.

*Trousseau, "Leçons Cliniques." Vol. II.; p. 114.

avoid obstacles vehicles and passers-by, and this indicates a certain consciousness; but in a similar case mentioned by Hughlings Jackson, the patient was thrown down by an omnibus, and on another occasion came near falling into the Thames.

How then are we to explain amnesia in cases where consciousness exists? By the extreme feebleness of the states of consciousness. There are only two means of giving fixity to a state of consciousness, viz.: intensity and repetition. The latter is reducible to the former, for repetition is a sum of lesser intensities. Here there is neither intensity nor repetition. The mental disturbance which follows the paroxysm is very well defined by Jackson when he calls it "an epileptic dream." One of his patients, nineteen years of age, and a person very unlikely to dogmatize on the subject, of his own accord hit upon the same expression. "Last time he had a fit and went to bed, and when in bed said, 'Wait a bit, Bill, I am coming.' He went down stairs; he unbolted the doors, and went out in his night-shirt. He came to himself just as he was stepping on the cold stones, and then his father touched him. He said he had had a dream. 'It's all right, *I have had a dream!*'"

In order to proceed from the known to the unknown, let us compare the mental state of epileptics with that of a dreamer. Dreams of which all recollection disappears instantly, are very common. We awake in the night out of a dream; the recollection of the interrupted dream is very clear; next morning not a trace remains. Who is there who has not tried over and over, in vain, to recall some dream of the previous night, of which he remembers nothing, except that he has had a dream?

The explanation is simple. The states of consciousness that make up a dream are extremely faint. They appear to be strong, not because they really are so, but because there is no strong state of consciousness to force them into the background. So soon as the waking state begins again everything resumes its own place. Images fade away in the presence of sense perceptions, these in the presence of a state of fixed attention, and this in the presence of a fixed idea. In short, consciousness during dreams has a minimum intensity.

Hence the difficulty is to explain why, during the period following an epileptic seizure, consciousness falls to a minimum. Neither physiology nor psychology can explain it, for neither science knows anything about the conditions of the genesis of consciousness. The problem is the more embarrassing because amnesia attaches to the delirium of epilepsy and to that delirium only, as we see in the case of those who are both epileptics and victims of alcoholism. A patient is seized with an epileptic fit during the day; he smashes everything within reach, and is violent in every way. After a brief period of quiet, he falls during the night into alcoholic delirium, which is characterized by frightful visions. Next day, coming to himself, he distinctly recollects the delirium of the night before, but has no remembrance of the delirium of the preceding day.

There is still another difficulty. If the amnesia is due to the weakness of the primary states of consciousness, how comes it that these faint states of consciousness determine the patient to acts? According to Hughlings Jackson, "mental automatism results from over action of low nervous centers, because the highest or controlling centers have been put out of use." We have here only an illustration of a well-known physiological law, viz., that the excito-motor power of the reflex centers increases when their connection with the superior centers is broken.*

Let us consider only the psychological problem: a solution of that is possible. If we insist on making consciousness a "force" self-existent and self-acting, everything becomes obscure. But if we hold, as was explained in the preceding chapter, that consciousness is a concomitant of a nervous state, and that this nervous state is the fundamental element, all becomes clear. At least it is no contradiction to say that a nervous state sufficient to determine certain acts is insufficient to awaken consciousness. To produce a movement and to produce a state of consciousness are two distinct and independent facts; the conditions of the one are not those of the other.

In conclusion, we may note that the inevitable consequence of repeated epileptic seizures, especially those of epileptic vertigo, is a progressive weakening of memory in its entirety. We shall later study this form of amnesia.

We now pass to cases of temporary amnesia of a destructive character. In the examples already cited, the capital accumulated down to the moment of the seizure is not impaired; the only effect is that something that was in the consciousness does not remain in the memory. In the examples which follow, a part of the capital is lost. Such cases make most impression on the imagination. Possibly some day, as physiology and psychology advance, they will from these cases teach us much regarding the nature of memory; just now these facts are not the most instructive—at least, in my estimation, whatever they may disclose to others.

These cases differ widely from one another. Sometimes the suspension of memory

*"A highly important character of epileptic mania." says Falret, *loc. cit.*, "is the absolute likeness of all the attacks in the same patient, not only their likeness as a whole, but in every detail. The same patient expresses the same thoughts, utters the same words, performs the same acts. There is a surprising uniformity in all the paroxysms.

begins at the onset of the disease, covering events that happen thereafter; again, it covers the events occurring just previous to the seizure; generally it extends in both directions, both to the time before and the time after the attack. Sometimes memory returns spontaneously, suddenly; sometimes slowly and with some little assistance; sometimes the loss of memory is total and the patient has to learn everything over again. We will present instances of all these different phases.

"A young woman, wedded to a man she loved passionately, was seized in child-bed with a long syncope, at the termination of which it was found that she had lost all memory of the time after and including her marriage. All the rest of her life down to that moment she remembered quite distinctly. At first she repelled her husband and her child, when presented to her. She never was able to regain the memory of that period of her life, nor of the events belonging to it. Her relatives and friends succeeded, by reasoning with her and by the force of their testimony, in persuading her that she had been married, and was a mother. She credited them, preferring to believe that she had lost the memory of a year, rather than to hold them all to be impostors. But her own convictions, her own inmost consciousness had no part in this. She saw before her her husband and her infant, but could not imagine by what magic she had won the one or given birth to the other."*

Here we see an instance of incurable amnesia, extending only backward in time. As for its psychological explanation, that is to be found in the destruction of the residua and the impossibility of their reproduction. In the following case, reported by Laycock, the amnesia extends forward only, and hence is to be attributed only to the fact that the states of consciousness cannot be registered and preserved. The engineer of a steamship had a fall upon his back, striking the back of his head against some hard object. For a while he lay unconscious. Coming to himself, he soon regained perfect physical health; he retained recollection of all the years preceding the accident, but from that moment forward memory no longer existed, even concerning facts strictly personal. On reaching the hospital he could not say whether he had come afoot, in a carriage or by railroad. On leaving the dinner table he forgot that he had taken that meal; he had no idea what hour, or day, or week it might be. He would strive to reflect so as to answer questions, but in vain. His speech was slow, but his language was correct. He says what he intends to say, and he reads correctly. This infirmity of memory gave way before suitable medical treatment.*

As a general rule, in cases of temporary amnesia, due to concussion of the brain, a retroactive effect is produced. The patient, on returning to consciousness, is found not only to have lost the recollection of the accident and the period succeeding it, but also to have forgotten a longer or shorter period prior to it. Many instances might be quoted in confirmation of this; I will cite only one, mentioned by Carpenter. †

A Mr. H. "was driving his wife and child in a phaëton, when the horse took fright and ran away; and, all attempts to pull him in being unsuccessful, the phaëton was at last violently dashed against a wall, and Mr. H. was thrown out, sustaining a severe concussion of the brain. On recovering, he found that he had forgotten the *immediate* antecedents of the accident; the last thing he remembered being that he had met an acquaintance on the road, about two miles from the scene of it. Of the efforts he had made and the terror of his wife and child he has not to this day any recollection whatever."

We next give some cases of amnesia of a far more serious character, some of them necessitating a complete re-education: I take them from the English magazine, "Brain."

The first observation, reported by Dr. Mortimer Granville, was made in the case of a hysterical woman twenty-six years of age, who, after over-exerting herself, was seized with a violent fit, accompanied with total loss of consciousness. "When consciousness began to return, the latest sane ideas formed previous to the illness mingled curiously with the new impressions received, as in the case of a person awakening slowly from a dream. When propped up with pillows in bed near the window, so that persons in the street could be seen, the patient described the moving objects as 'trees walking'; and when asked where she saw these things, she invariably replied, 'in the other Gospel.' In short, her mental state was one in which the real and ideal were not separable. Her recollections on recovery, and for some time afterward, were indistinct, and, in regard to a large class of common topics which must have formed the staple material of thought up to the period of the attack, memory was blank. Special subjects of thought immediately anterior to the malady seemed to have saturated the mind so completely that the early impressions received after recovery commenced were imbued with them, while the cerebral record of penultimate brain-work in the life before the morbid state, was, as it were, obliterated. For example, although this young woman had supported herself by daily duty as a governess she had no recollection of so simple a matter as the use of a

* "Lettre de Charles Villiers à G. Cuvier." (Paris, Lenormant, 1802).

* Laycock, on "Certain Disorders and Defects of Memory." Page 12.

† Op. Cit., p. 450.

writing implement. When a pen or pencil was placed in her hand, as it might be thrust between the fingers of a child, the act of grasping it was not excited, even reflexly; the touch or sight of the instrument awoke no association of ideas. The most perfect destruction of brain-tissue could not more completely have effaced the constructive effect of education and habit on the cerebral elements. This state lasted some weeks."* Memory of what had been forgotten was recovered slowly, painfully, though there was no necessity for so complete a re-education as in the next case.

The second observation, which we owe to Professor Sharpey, furnishes one of the most curious instances of re-education ever recorded. I take from his long article only the psychological details. Here, too, the subject was a woman twenty-four years of age, and of delicate constitution, who for some six weeks suffered from an irresistible tendency to fall asleep. This condition grew more pronounced from day to day. About June 10 it was impossible to awaken her. She continued thus for two months. She was fed with a spoon, and swallowed the food: when she had had enough, she closed her teeth and turned her mouth away. She appeared to distinguish flavors, for she steadily refused certain kinds of food. At long intervals she had brief moments of waking. She answered no questions and recognized nobody, save once when she recognized "an old acquaintance, whom she had not seen for more than twelve months. She looked steadfastly in this person's face for a few seconds, apparently occupied in trying to remember his name, which at length she found out and repeated again and again, at the same time taking him by the hand as if overjoyed to see him. She then again fell into her slumber." Toward the end of August she returned little by little to her normal state.

Here began the work of re-educating her. "On her recovery from the torpor, she appeared to have forgotten nearly all her previous knowledge; everything seemed new to her, and she did not recognize a single individual—not even her nearest relatives. In her behavior she was restless and inattentive, but very lively and cheerful; she was delighted with everything she saw or heard, and altogether resembled a child more than a grown person.

"In a short time she became more sedate, and her attention could be longer fixed on one object. Her memory, too, so entirely lost, as far as regarded previous knowledge, was soon found to be most acute and retentive with respect to everything she saw or heard subsequently to her disorder, and she has by this time recovered many of her former acquirements, some with greater, others with less facility. With regard to these, it is remarkable that though the process followed in regaining many of them apparently consisted in recalling them to mind with the assistance of her neighbors rather than in studying them anew, yet even now she does not appear to be in the smallest degree conscious of having possessed them before.

"At first it was scarcely possible to engage her in conversation; in place of answering a question, she repeated it aloud in the same words in which it was put, and even long after she came to answer questions she constantly repeated them once over before giving her reply. At first she had very few words, but she soon acquired a great many, and often strangely misapplied them. She did this, however, for the most part in particular ways; she often, for instance, made one word answer for all others which were in any way allied to it. Thus, in place of 'tea,' she would ask for 'juice,' and this word she long used for liquids. For a long time, also, in expressing the qualities of objects, she invariably, where it was possible, used the words denoting the very opposite of what she intended, and thus she would say 'white' in place of 'black,' 'hot' for 'cold,' etc. She would often, also, talk of her arm when she meant her leg, her eye when she meant her tooth, etc. She now generally uses her words with propriety, although she is sometimes apt to change her terminations or compose new ones of her own.

"She has as yet recognized no person, not even her nearest connections; that is to say, she has no recollection of having seen or known them previous to her illness, though she is aware of having seen them since, and calls them either by their right names or by those of her own giving, but she knows them only as new acquaintances, and has no idea of what relations they sustain to herself. She has not seen above a dozen people since her illness, and she looks on these as all that she has ever known.

"Among other acquirements, she has recovered that of reading; but it was requisite to begin with the alphabet, as she at first did not know a single letter. She afterward learned to form syllables and small words, and now she reads tolerably well, and has shown herself much interested in several stories previously unknown to her, which she has read since her recovery. The re-acquisition of her reading was eventually facilitated by singing the words of familiar songs from the printed page, while she played on the piano. In learning to write she began with the most elementary lessons, but made much more rapid progress than a person who had never before been taught. Very soon after the torpor left her she could sing many of her old songs, and play on the pianoforte with little or no assistance, and she has since continued to practice her music, which now affords her great pleasure and amusement. In singing, she at first generally required to be helped

* "Brain," Oct. 1879, p. 317, seqq.

to the first two or three words of a line, and made out the rest apparently from memory. She can play from the music book several tunes which she had never seen before; and her friends are inclined to think that she now plays and sings fully as well, if not better, than she did previously to her illness She learned backgammon, which she formerly knew, and several games at cards, with very little trouble; and she can now knit worsted, and do several other sorts of work; but with regard to all these acquirements, as already mentioned, it is remarkable that she appears not to have the slightest remembrance of having possessed them before, although it is plain that the process of recovery has been greatly aided by previous knowledge, which, however, she seems unconscious of having ever acquired. When asked how she had learned to play the notes of music, from a book, she replied that she could not tell, and only wondered why her questioner could not do the same.

"She has once or twice had dreams, which she afterward related to her friends, and she seemed quite aware of the difference betwixt a dream and a reality; indeed, from several casual remarks which she makes of her own accord, it would appear that she possesses many general ideas of a more or less complex nature, which she has had no opportunity of acquiring since her recovery."*

So far as we may judge from Dr. Sharpey's narrative this re-education did not take more than three months; nor is that an unexampled circumstance. "A clergyman, of rare talent and energy, of sound education, was thrown from his carriage and received a violent concussion of the brain. For several days he remained utterly unconscious, and when restored his intellect was observed to be in a state similar to that of a naturally intelligent child. Although in middle life, he commenced his English and classical studies under tutors, and was progressing satisfactorily, when, after several months' successful study, his memory gradually returned, and his mind resumed all its wonted vigor and its former wealth and polish of culture."†

"A gentleman about thirty years of age, of learning and acquirements, at the termination of a severe illness, was found to have lost the recollection of everything, even the names of the most common objects. His health being restored, he began to re-acquire knowledge like a child. After learning the names of objects, he was taught to read, and, after this, began to learn Latin. He made considerable progress, when, one day, in reading his lesson with his brother, who was his teacher, he suddenly stopped and put his hand to his head. Being asked why he did so, he replied, 'I feel a peculiar sensation in my head; and now it appears to me that I knew all this before.' From that time he rapidly recovered his faculties."*

I hold it sufficient, for the present, to lay these facts before the reader. The remarks they suggest will find more suitable place elsewhere. I shall conclude with a case little known, which marks the natural transition to intermittent amnesia. We shall, in fact, see gradually formed a provisional memory, and this again suddenly disappearing before the original memory.

A young woman, robust and healthy, accidentally fell into a river and was nearly drowned. She was insensible for six hours and then returned to consciousness. Ten days afterward she fell into a profound stupor which lasted four hours. On opening her eyes she no longer recognized any one, and she was deprived of hearing and speech, taste and smell. She retained only sight and touch, and these senses were of extreme sensibility. Ignorant of everything, and unable to stir, she was like an animal deprived of its brain. She had a good appetite, but she had to be fed; she ate all sorts of food indifferently, swallowing it in purely automatic fashion. Indeed, so strictly automatic was her whole activity that for days her only occupation consisted in unraveling, picking or clipping into minute pieces everything that come to her hand, as flowers, paper, clothing, etc., and then arranging the scraps to form certain rude patterns. Later her friends supplied the materials for making patchwork, and after a few preparatory lessons she took up the needle and worked incessantly from morning till night, making no distinction between Sunday and week-day, and even unable to perceive the difference. She retained no recollection of events from one day to another, and each morning she began a new task. Still, like an infant, she was beginning to register a few thoughts and to acquire some experience. She was next put at work of a little higher character, worsted work. She seemed to take great pleasure in gazing at the patterns with their flowers and their harmony of colors; but each day she would commence a new piece, forgetting that of the day before, unless it was set before her.

The thoughts derived from her former experience that seemed to be first reawakened, were connected with two matters that had made a strong impression upon her, namely, the fall into the river and a love affair. When a landscape was shown her containing a river or a view of a troubled sea, she became greatly agitated, and forthwith would have an attack of spasmodic rigidity accompanied by insensibility. So great was the fright given her by the sight of water, especially water in motion, that pouring water from one vessel into another was enough to make her tremble. It was observed that when

* "Brain," April, 1879.
† Forbes Winslow, *op. cit.*, p. 317.

* *Ibid.*

she washed her hands, she simply dipped them in the water, as gently as possible.

From the beginning of her malady the visits of a young man to whom she was attached gave her evident pleasure, even while she was insensible to everything else. He came regularly every evening, and she always looked for his arrival. At a time when she could not recall any occurrence an hour after it had happened, she used to look anxiously for the door to open at the accustomed hour, and if he did not come, she would be ill-humored the rest of the evening. On being taken into the country, she became low-spirited, irritable, and her paroxysms were frequent. But while the young man remained near her, her intellectual faculties and her memory were visibly improved.

This return of her faculties was going on gradually all the time. One day seeing her mother much grieved, she suddenly exclaimed, after a moment's hesitation, "What is the matter?" From that moment forth she began to articulate a few words, though she called neither persons nor things by their true names. The pronoun "this," was her favorite word, and she applied it to all sorts of objects, animate and inanimate alike. The first objects she called by their own names were wild flowers, for which she had shown a strong liking from her childhood. At this period she had as yet no recollection whatever of the places or the persons associated with her early years.

"The mode of recovery of this patient was quite as remarkable as anything in her history. Her health and bodily strength seemed completely reestablished, her vocabulary was being extended, and her mental capacity was improving, when she became aware that her lover was paying attention to another woman. This idea immediately and very naturally excited the emotion of jealousy; which, if we analyze it, will appear to be nothing else than a painful feeling connected with the idea of the faithlessness of the object beloved. On one occasion this feeling was so strongly excited that she fell down in a fit of insensibility, which resembled her first attack in duration and severity. This, however, proved sanatory. When the insensibility passed off, she was no longer spell-bound. The veil of oblivion was withdrawn; and, as if awakening from a sleep of twelve months' duration, she found herself surrounded by her grandfather, grandmother, and their familiar friends and acquaintances. She awoke in the possession of her natural faculties and former knowledge, but without the slightest remembrance of anything which had taken place in the year's interval from the invasion of the first fit up to the present time. She spoke, but she heard not; she was still deaf, but, being able to read and write as formerly, she was no longer cut off from association with others. From this time she rapidly improved, but for a while continued deaf. She soon perfectly understood by the motion of her lips what her mother said; they conversed with facility and quickness together, but she did not understand the language of the lips of a stranger. She was completely unaware of the change in her lover's affections, which had taken place in her state of 'second consciousness;' and a painful explanation was necessary. This, however, she bore very well; and she has since recovered her bodily and mental health."*

We shall see further on, when we shall have traversed all the facts, what general conclusions as to the mechanism of memory are to be drawn from its pathology. For the moment we shall restrict ourselves to a few observations suggested by the foregoing facts.

In the first place we would remark that the cases just cited, though classed by physicians under the general head of total amnesia, in reality belong, from the psycological point of view, to two different morbid types.

The first type (represented by the cases observed by Villiers, Laycock, Mortimer Granville, etc.) is by far the more frequent. We have given only a few examples, so as not to weary the reader with monotonous and unprofitable repetition. What characterizes this type, psychologically, is the fact that here the amnesia attaches only to the least automatic and least organized forms of the memory. In cases belonging to this morbid group neither the habits nor skill in any handicraft, as sewing or embroidery, nor the power of reading or writing, or speaking one's own or other languages, disappears; in short, memory in its organized or semi-organized form, remains intact. The destruction of memory in these cases affects only its highest and most instable forms, those personal in character and which, being accompanied by consciousness and localization in time, constitute that which in the preceding chapter we called psychic memory proper. It is further to be remarked that the amnesia covers the most recent events—extending backward from the present over a period of variable duration.† This may at first cause surprise, for our latest recollections would seem to be the most vivid, the strongest. But, in fact, this result is perfectly natural, the stability of a remembrance being in a direct ratio to its degree of organization. But I will not dwell upon this point, which will be considered at length elsewhere.

The physiological reason of amnesia in this group is purely hypothetical, and it probably is different in different cases. First (as we see especially in Laycock's observation)

* Dunn, in the "Lancet," 1845. See Carpenter, op. cit. p. 460, *et seq.*

† I must, however, mention a case reported by Brown-Séquard, where a patient, in consequence of an attack of apoplexy, lost recollection of five years of his life. These five years, which included the time of his marriage, *ended* just six months before the date of his attack.

the power of registering new experiences is temporarily suspended; states of consciousness disappear as quickly as they appear, leaving no trace. But what becomes of the recollections registered previously for weeks, and months and years? They persisted, they were preserved and were recalled formerly; they seemed to be a lasting acquisition, yet in their place is now a void. This the patient fills by device and indirectly from the testimony of others and from his own reflections, thus more or less satisfactorily connecting his present with what remains to him of his past. It does not appear from the observations made that he ever fills this void by a direct reminiscence. Hence two suppositions are equally warranted; viz., that either the registration of the prior states has been effaced; or that the retention of the anterior states persisting, their aptitude for being revived by associations with the present is destroyed. We are not in a position to decide between these two hypotheses.

The other, and less frequent morbid type is represented in the cases reported by Sharpey and Winslow (that observed by Dunn marks a transition to intermittent amnesia). Here the work of destruction is complete: memory in all its forms—organized, semi organized, and conscious—is done away. There is complete amnesia. As we have seen, the authors who have described it compare the patient to an infant and his mind to a *tabula rasa*. These expressions, however, are not to be taken in the strict sense. The cases of re-education which we have cited show that though all prior experience is made null, there yet remain in the brain some few latent aptitudes. The extreme rapidity of the new education, especially in its later stages, were otherwise inexplicable. Facts tend to prove beyond question that this recovery of aptitudes, which seems the work of artifice, is above all the work of nature. The memory returns because the atrophied nerve elements are in time succeeded by other nerve elements possessing the same properties, whether original or acquired, as those they succeed. This is another proof of the relation which subsists between memory and nutrition.

Finally—for all cases of amnesia cannot be reduced to one formula—in cases where the loss and the recovery of memory are sudden we readily perceive the analogues of those phenomena of arrest of function or "inhibition," now closely studied by physiologists, but of which very little is known.

II.

The study of periodical amnesia is far better calculated to throw light upon the nature of the Ego and the conditions of existence of the conscious personality, than to exhibit the mechanism of memory under a new aspect. It forms an interesting portion of a work that has never yet been written in full and whose title might be "Diseases and Aberrations of Personality." It will be difficult for us to avoid touching upon this subject every moment, but I shall endeavor to say of it only what is indispensable for clearness of exposition.

I shall be sparing of illustrative facts, for they are sufficiently known. The study of so-called cases of "double consciousness," is quite in the fashion. Dr. Azam's detailed and instructive study, in particular, has given the general reader a clearer idea of what is meant by periodic amnesia, than could be got from any definition. I shall, therefore, content myself with a review of the principal cases, proceeding from the most perfect phase of periodic amnesia to its most elementary forms.

1. The clearest, most unquestionable and most perfect case of periodic amnesia on record is that given by Macnish in his "Philosophy of Sleep," and which has since been ofttimes quoted: A young American woman, on awaking from a protracted sleep, lost memory of all she had before learned. "Her memory was capacious and well stored with a copious stock of ideas. Unexpectedly, and without any forewarning, she fell into a profound sleep, which continued several hours beyond the ordinary term. On waking, she was discovered to have lost every trace of acquired knowledge. Her memory was *tabula rasa*—all vestiges, both of words and things, were obliterated and gone. It was found necessary for her to learn everything again. She even acquired, by new efforts, the art of spelling, reading, writing and calculating, and gradually became acquainted with the persons and objects around, like a being for the first time brought into the world. In these exercises she made considerable proficiency. But, after a few months, another fit of somnolency invaded her. On rousing from it, she found herself restored to the state she was in before the first paroxysm; but was wholly ignorant of every event and occurrence that had befallen her afterward. The former condition of her existence she now calls the old state, and the latter the new state; and she is as unconscious of her double character as two distinct persons are of their respective natures. For example, in her old state she possesses all the original knowledge, in her new state only what she acquired since. In the old state she possesses fine powers of penmanship, while in the new she writes a poor, awkward hand, having not had time or means to become an expert."*

Dismissing for the moment all that relates to the alternation of the two personalities, we see that there have been formed here two perfect memories entirely independent of each other. It is not alone the memory of personal facts, the fully conscious memory,

* Macnish, "Philosophy of Sleep."

that is cut into two parts which never re unite, and which have no cognizance of each other: the same lot befalls the semi-organic, semi-conscious memory which serves us in speaking, in reading, and in writing. We are not informed whether this disscission of memory extended also to its purely organic forms, the habits,—whether the patient for instance had to learn anew how to use the hands for every-day offices, as in eating, putting on clothes, and the like. But even though we suppose this group to have remained intact, the separation into two distinct and independent groups is so complete as to satisfy the most exacting observer.

Dr. Azam recounts a case resembling this, but far less clearly defined. The normal memory disappears, and reappears periodically. In the interval no new memory is formed, but the patient retains a beggarly remnant of his old memory: such at least is the inference to be drawn from the record of an observation whose psychological details are not always very accurate.* The case was that of a youth who, having been subject to chorea, lost all memory of the past, forgot all that he had ever been taught, could no longer read, nor write, nor count, and recognized none of the persons around him except his father, his mother, and the nun who attended him. Yet while the amnesia lasted—and usually its term was a month—the young man could ride on horseback, drive a carriage, lead his accustomed life, and say his prayers very regularly at the proper times. Memory usually came back suddenly. So far as we may judge, there was in this case a periodic suspension of the memory in its instable and semi-stable—or conscious and semi-conscious—forms (consciousness being as a rule in ratio inverse to stability). But whatever had to do with organized memory remained intact: the lowermost strata of memory stood firm. I will not, however, dwell upon a case which has not been reported with sufficient details to warrant a psychological interpretation.

II.—A second and less complete, but more frequent form of periodic amnesia is that so interestingly described by Dr. Azam, in the case of Félida X., and of which Dr. Dufay found the analogue in the case of one of his patients. These cases are so well known, and the original narratives so accessible, that a brief summary of them will suffice here.

A woman subject to hysteria was in 1856 attacked by a singular disease in consequence of which she thereafter led a two-fold life, passing alternately from one to another of two states, designated by Dr. Azam, as the "first" and the "second" state. In her normal ("first") state, she was grave, serious, reserved, industrious. Suddenly she would fall asleep, lose consciousness, and on returning to herself, she was found to be in the second state. Her character is now altered. She is gay, talkative, imaginative, coquettish. "She remembers perfectly all that occurred in other like states before, as well as what occurred in her normal state." Then after a longer or shorter period she again falls into a stupor. On coming out of this she resumes her first state. But now she has forgotten all that occurred in her second state, remembering only the occurrences of her prior normal states. I may add that as she grows older the periods of the normal state became shorter and shorter, and farther apart, and the transition from one state to the other now takes place instantaneously, whereas before it used to take ten minutes.

Such are the main features of this case. So far as it concerns our particular inquiry, it may be summed up in a few words. The patient passes alternately from one state to the other; in the one, she possesses all her memory; in the other, she has but a partial memory covering all states of the same kind.

The case observed by Dr. Dufay, at Blois, is very like this. During the period answering to Félida's "second state," Dr. Dufay's patient "recollects the most trifling occurrence of her normal or of her somnabulistic state." There is also the same alternation of character, and in her period of perfect memory she speaks of her normal state as the "état bête"—the "brute state."

It is important to observe how, in this form of periodic amnesia, a portion of the memory is never affected but persists through both states. "In both states," says Dr. Azam, "the patient can read, write, count, and use the scissors or the needle as well as ever she could." There is not, as there was in the case cited by Macnish, a perfect scission between the two states: the semi-conscious states of memory are equally active in both.

III.—To complete our exposition of the different modes of periodic amnesia we will describe certain cases which present only some of its elements; they are seen in somnambulism, whether natural or induced. As a rule, somnambulists, on coming to themselves, have no recollection of what they said or did, but each crisis brings back the recollection of the preceding crisis. There are exceptions to this law, but they are rare. Macario's narrative has often been cited, of a girl who having been violated during a fit of somnambulism, had no cognizance of the fact on awakening, but who in her next somnambulistic state made it known to her mother. Dr. Mesnet witnessed a patient's attempt at suicide made with a good deal of judgment during two consecutive fits of somnambulism. A young maid servant every evening for three months thought she was a bishop, acting and speaking in that character; and Hamilton speaks of a poor apprentice who as soon

* "Revue Scientifique," 22 Dec., 1877. For instance, it is there said that during one of the attacks the patient "could converse intelligently and with animation, though he had not recovered his memory." (?)

as he fell asleep believed himself to be the father of a family, wealthy, a senator: every night he would recount his story in due order, in a loud voice, and if any one asked him about his apprenticeship, he would say that he was no apprentice. But it is useless to multiply examples; they exist in abundance, and they all show that side by side with the normal memory there is formed, during paroxysms, a partial, temporary, parasitic memory.

In summing up the general characters of periodic amnesia as exhibited in the phenomena, we find in the first place the *formation of two memories*.

In the perfect form of periodic amnesia (*e. g.*, Macnish's case) the two memories are mutually exclusive—the one appearing, the other disappears. Each suffices for itself; each has, so to speak, its own outfit. That organized memory whereby we are able to speak, write, read, is not common to the two states, but for each state there is formed a distinct memory of words, and of graphic signs, and of the mode of tracing them.

In the incomplete form (cases reported by Azam and Dufay, also in somnambulism) there is alternating with the normal memory a partial memory. The former includes all the states of consciousness; the latter only a restricted group of states which separate themselves from the others, and form in the life of the individual a series of fragments linked together. But the two memories have a common ground in the less stable, less conscious forms of memory, which enter equally into both groups.

The result of this scission of the memory is that the individual seems to himself, or at least to others, as though he led a two-fold life—a natural illusion, for the Ego consists (or seems to consist) in the possibility of associating with present states—states that are recognized, *i. e.*, localized in the past, according to processes which we have striven to describe. Here we have two distinct centers of association or attraction, each attracting one group of facts, and in no wise affecting other groups.

It is evident that this formation of two memories, each totally or partially excluding the other cannot be a normal fact. It is the symptom of a morbid process—the psychic expression of a disorder, the nature of which remains to be determined. And this leads us, much to our regret, to treat in an incidental way a large question—that of the conditions of personality.

First, we must lay aside the idea of an Ego regarded as an entity distinct from states of consciousness. Such hypothesis is both useless and self-contradictory; it is an explanation worthy only of a psychology in its infant state, that takes that to be simple which so appears, and which invents instead of explaining. I accept the opinion of contemporary scholars who recognize in the conscious person a something composite, a resultant of highly complex acts.

The Ego, as it appears to itself, consists of a sum of states of consciousness. There is a principal state of consciousness around which secondary states are grouped and which these tend to supplant, they themselves being in turn pressed by other states that are hardly states of consciousness at all. The state which acts the principal part, after a longer or shorter contest, gives way, being displaced by another around which we have another similar grouping. The mechanism of consciousness may be compared, without any metaphor, with that of vision. In the latter there is a visual *point* which alone gives a clear and definite sense perception; round about this is a *field* of vision which grows less and less clear and definite in proportion as it recedes from the center and approaches the circumference. Our Ego is at each moment—that present that is ever being renewed—in great part re-constituted by memory; that is to say, to the present state are associated other states which, being thrown back into and localized in the past, constitute our personality as it appears at each moment. In a word, the Ego may be considered in two ways—either in its actually present state, and then it is the sum of our actually present states of consciousness; or in its continuity with the past, and then it is formed by memory according to a process we have already described.

From this it might appear as though the identity of the Ego rested entirely on memory; but that view takes note only of a part of the facts. Under the instable compound that is each moment forming, breaking up, and forming again, there stands something that persists, viz., that dim consciousness which is the result of all the vital actions which constitutes our perception of our own bodies, and which has been designated by one word—*cœnæsthesis*. Our apprehension of it is so vague that it is difficult to speak of it in precise language. It is a state which, being perpetually repeated, makes no special impression on consciousness, and is like a habit. But though it is felt neither in itself nor in the gradual variations which constitute the normal state of the organism, it sometimes undergoes instantaneous or rapid variations which change the personality. All alienists teach that the incubation period of mental diseases is indicated not by intellectual disturbance, but by changes in *character*—and character is simply the psychic aspect of cœnæsthesis. So, too, we know that an organic lesion may transform the cœnæsthesis; substituting for the ordinary sense of existence a feeling of sadness, distress, anxiety, without cause, as the patient supposes; or again it may inspire feelings of gladness, satisfaction, buoyancy, perfect contentment—deceptive indications of grave

disorganization, the most striking illustration of which is seen in what has been called the euphoria of the dying. All these changes have a physiological cause; they represent its echo in the consciousness; and to say that while these variations are felt the normal state is not felt, is in effect to affirm that our normal life is not a mode of living because it is monotonous. This cœnæsthesis which, just because it is perpetually repeated, lies below the plane of consciousness is the true basis of personality. And it is so because, being always present, always active, without rest or respite, it knows neither sleep nor fainting, and endures as long as life itself, of which indeed it is but one form. This it is which serves as the ground of the conscious Ego constituted by memory; it is this which makes associations possible and when formed maintains them.

Hence the unity of the Ego is not a mathematical point, but that of a highly complex mechanism. It is a consensus of vital processes coordinated first by the nervous system, the great coordinating agency of the organism, and then by the consciousness, whose natural form is unity. It is in fact of the very nature of psychic states that they can coexist only in a very small number, grouped round one principal state which alone represents consciousness in its fullness.

Suppose, now, that we could instantly change our body and put another in its place —skeleton, vessels, viscera, muscles, all new except the nervous system, which remains the same, with all its past duly registered. There is no doubt but that in such case the afflux of unwonted life-sensations would produce the greatest confusion. Between the old cœnæsthesis, impressed on the nervous system, and the new cœnæsthesis acting with the intensity of everything new and unwonted, there would be irreconcilable opposition. This hypothesis is realized to a certain extent in morbid cases. Some obscure organic trouble occasionally so modifies the cœnæsthesis that the subject believes himself to be made of stone, or butter, or wax, or wood; that he is of the opposite sex, or that he is dead. But apart from morbid cases, consider what takes place at puberty: "When certain parts of the body that before were inactive assume the active state, a complete revolution takes place in the organism. A mass of new sensations, new desires, new imaginings, more or less distinct, new impulses come into the consciousness in a relatively brief space of time. Little by little they penetrate within the circle of the thoughts of longer standing, and form an integral part of the Ego. The latter becomes a different being: it is transformed, and the feeling of its self-hood undergoes a radical metamorphosis. Until assimilation is complete, this penetration and this dissociation of the primitive Ego can hardly be brought about without great commotion of the consciousness and tumultuous disturbance."* It may be affirmed that whenever changes in the cœnæsthesis, instead of being insensible or temporary, are rapid and permanent, discord arises between the two elements that constitute our personality in the normal state—the general sense of our body (cœnæsthesis) and conscious memory. If the new state holds its own, it becomes a center round which new associations group themselves; thus is formed a new complex, a new Ego. The antagonism between these two centers of attraction—the old, which is tending to dissolution, and the new, which is in process of development—produces different results according to circumstances. Sometimes the original Ego disappears, after enriching the new with its accumulated acquisitions, that is, with a portion of the associations of which it consisted. Again, the two Egos alternate, neither supplanting the other. Sometimes the original Ego exists no longer save in memory, but not being connected with any cœnæsthesis, it appears to the new as something extraneous.†

The object of the foregoing digression was to assign logical ground for what had before rested on mere assertion; namely, that periodic amnesia is only a secondary phenomenon; its cause is to be found in a vital disturbance, the general sense of existence (cœnæsthesis) which, properly speaking, is simply the sense of the unity of our body, passing through two alternate phases. This is the prime cause which produces the formation of two association-centers, and consequently of two memories.

Pursuing our investigation further, other questions meet us, to which unfortunately we can make no reply.

1. What is the physiological cause of these rapid and regular variations of cœnæsthesis? Only hypothetical replies have been offered (state of the vascular system, inhibitory action, etc.).

2. Why is each form of cœnæsthesis connected with certain forms of association, to the exclusion of others? We do not know, and can only say that in periodic amnesia the retention of impressions remains intact; that is to say, the cell modifications and dynamic associations remain; the power of recalling them is alone affected. The associations have two starting points: one state (A) may call out certain groups, but is incapable of awakening other groups; another

* Griesinger, "Traité des Maladies Mentales," p. 55. *et seq.*

† Thus I explain a case mentioned by Leuret ("Fragments psych. sur la folie," p. 277). An insane woman who spoke of herself as "*la personne de moi-même*" ("The person of myself"), had retained a very distinct memory of her life down to the beginning of her insanity, but she referred that period of her life to another person. Of her former Ego nothing but the recollection remained. Much might be said of such confusion of personality, but the discussion would take us beyond the subject we are treating.

state (B) does the reverse. Some groups enter equally into both complexes (incomplete scission).

In short, two physiological states, by their alternation, determine two cœnæstheses, and these determine two forms of association, and consequently, two memories.

To complete our observations on this subject, it is well to refer briefly to the natural connection established, in spite of interruptions, sometimes of considerable duration, between periods of the same kind, and particularly between different fits of somnambulism. This fact, interesting as it is on several accounts, can be considered here only so far as it exhibits a periodical and regular return of the same recollections. Abnormal as it may at first appear, it is entirely logical and in full agreement with our conception of the Ego. For if the Ego at each instant is but the sum of the actual states of consciousness and of the vital processes in which consciousness has its root, it follows that every time that this physiological and psychological complex shall be constituted, the Ego will be the same and the same associations will be called up. In each attack a special physiological state is produced; the senses are closed to nearly all external excitations, and consequently many associations can no longer be awakened. There is a simplification of the mental life: it is reduced almost to a mechanical condition. These states, by their very simplicity very closely resemble one another, and differ totally from the waking state. It is, therefore, natural that the same conditions should produce the same effects, that the same elements should give rise to the same combinations, and that the same associations should be awakened to the exclusion of others. They find in the pathological state their conditions of existence, which in the normal state either are wanting, or are in antagonism with many other conditions.

In the state of health and in the waking state the phenomena of consciousness are so varied, so numerous, that the same combination has little chance of being awakened many times in succession, though in certain abnormal cases this is seen to occur, under the action of unknown causes. A clergyman, says Dr. Reynolds, apparently in good health, went through the pulpit service one Sunday morning with perfect consistency, his choice of hymns and lessons, and his extempore prayer being all related to the subject of the sermon. The Sunday following he went through the service in precisely the same manner, selecting the same hymns and lessons, making the same prayer, giving out the same text, and preaching the same sermon. On descending from the pulpit he had not the slightest remembrance of having gone through precisely the same service on the preceding Sunday. He was much alarmed, and feared an attack of brain disease, but nothing of the kind supervened.*

A like return of memory sometimes occurs in drunkenness, as in the well-known case of the Irish porter, who, having lost a package while drunk, got drunk again, and remembered where he had left it.

As has been already said, cases of periodic amnesia, curious though they may be, teach us more as to the nature of the Ego than as to the nature of memory. Still they are instructive, and we will return to them in the next paragraph.

III.

Progressive amnesia is that form which by a slow and continuous process of dissolution leads to complete abolition of memory. This definition applies to the majority of cases, and it is only in exceptional instances that the morbid evolution fails to result in total extinction. The process of the disease is very simple and does not impress the imagination, precisely because it is gradual, but it is highly instructive because, in showing how the memory is disorganized, it teaches us how it is organized.

Here we are not called upon to cite special cases of rare occurrence or of exceptional character. It suffices to describe just one morbid type that is very nearly constant.

The primary cause of the disease is some progressive lesion of the brain—cerebral hemorrhage, apoplexy, softening of the brain, general paralysis, senile atrophy and the like. In the early stages there exist only partial disorders. The patient is subject to frequent moments of forgetfulness, always with respect to *recent* occurrences. If he drops the work he happens to be doing, he forgets to take it up again. The events of yesterday and the day before, the order he has received, the resolution he has taken—all are blotted out at once. This partial amnesia is the habitual symptom of incipient general paralysis. Lunatic asylums are full of patients belonging to this category who, the day after they are received, declare that they have been a year, five years, ten years in the institution. They have only a faint remembrance of having left their homes and families; they cannot tell the day of the week nor the month of the year. But their memory of what they did and what they learned before the onset of the disease is still intact. It is a familiar observation that in aged persons the characteristic failure of memory has reference to recent occurrences.

That is about as far as the data of the received psychology go. The conclusion would seem to be that the dissolution of memory does not follow any law. I will offer proof to the contrary.

To discover the law we must make a psychological study of the progress of demen-

* *Apud.* Carpenter, *op. cit.*, p. 444.

tia.* When the premonitory stages, of which we have spoken, are past, there supervenes a general and gradual enfeeblement of all the faculties, till at last the individual is reduced to a purely vegetative life. Physicians distinguish several species of dementia, as senile, paralytic, epileptic, etc., according to the cause which produces it. These distinctions do not concern us. The break-up of the mind is always the same thing whatever the cause may be, and in it alone are we interested. The question therefore is, in this breaking up of the mind, does the loss of memory proceed in a fixed order?

The many alienists who have described dementia have not dwelt on this question, as it has no importance for them. Their testimony, therefore, will be all the more valuable if we can find an answer in their writings: and we do. On consulting the best authors (Griesinger, Baillarger, Falret, Foville, etc.,) we learn that the amnesia, at first restricted to recent events, later extends to ideas, then to feelings and affections, and finally to acts. Here we have all the data of a law. To determine what the law is we have only to examine successively these several groups.

1. That the weakening of the memory first affects the recollection of recent events is an observation so familiar that we fail to notice how it contradicts our a priori ideas. One would suppose that the most recent occurrences, those nearest to the present would be the most stable, the most distinctly remembered, and such is in fact the case in the normal state. But at the setting in of dementia there occurs a serious anatomical lesion—the degeneration of the nerve cells begins. These elements, tending to atrophy, can no longer retain new impressions. In more precise language, no new modification of the cells, and no formation of new dynamic associations is possible, or at least durable. The anatomical conditions of stability and reviviscence are wanting. If the perception is entirely new, it is not registered in the nerve centers and is instantly blotted out. If it is only a repetition of prior experiences that are still vivid, the patient refers the perception to the past; the concomitant circumstances of the actual perception are quickly effaced, and cannot be localized in time. But the modifications fixed years before in the nerve elements and now become organic; the dynamic associations and groups of associations that have been repeated hundreds and thousands of times, still persist; they have greater power of resistance to meet destructive forces. Thus is explained the paradox of memory, that the new dies before the old.

2. Soon this old-time store of organic and conscious memories, on which the patient for a time subsists, is in turn dissipated. His intellectual acquisitions are lost, one after another (scientific, artistic, professional knowledge, languages, etc.). His personal recollections fade away, those of later years first, those of childhood last. When the process of decay is in an advanced stage, the stories and ditties of childhood even return. Often the demented forget in great part their own language. A few expressions are remembered by accident, but commonly the patient repeats automatically the words he retains. The anatomical cause of this intellectual dissolution is an atrophy which, little by little, invades the cortex of the brain, and then the white matter, producing a fatty and atheromatous degeneration of the cells, tubes and capillaries of the nerve-substance.

3. It has been noticed by the best observers that the affectional faculties are extinguished far more slowly than the intellectual. It may at first seem strange that states so vague as those of feeling and sentiment should be more stable than ideas and intellectual states in general. But reflection shows that the feelings are the deepest, the inmost, the most persistent features of our mental constitution. Whereas the intelligence is something acquired and as it were external to us, the feelings are inborn. Considered in their origin, aside from any refined and complex forms they may assume, they are the direct and permanent expression of our organism. The viscera, muscles, bones—every tissue of our bodies contributes its share toward their formation. What are we but our feelings and sentiments? to forget them is to forget ourselves. Hence amnesia of the feelings must naturally occur only at a period when disorganization has gone so far that the personality begins to break up.

4. The acquisitions that longest withstand dissolution are those which are almost entirely organic—the daily routine, habits to which we have long been addicted. Many patients can arise in the morning, dress themselves, take their meals regularly, go to bed, engage in manual labor, play cards and other games, sometimes with remarkable skill, though the judgment, the will, the affections are extinguished. This automatic activity, which presupposes only a minimum of conscious memory, belongs to that lower form of memory for which the cerebral ganglia, the medulla and the spinal cord suffice.

The progressive destruction of the memory therefore follows a logical course, a law. *It descends progressively from the instable to the stable.* It begins with the recent recollections which, being but faintly impressed on the nerve elements, seldom repeated, and consequently but feebly associated with other recollections, represent organization in its lowest stage. It ends with that sensorial, instinctive memory which, being rooted in the organism and become a part of it, or rather become the organism itself, represents organization in its most pronounced aspect. From the initial to the final term the progress

* The term is used here in its medical sense, not as a synonym of insanity in general.

of amnesia, determined by the nature of things, follows the line of least resistance, that is, of least organization. Thus pathology fully bears out what we have said with regard to memory. It is a process of organization in varying degrees between two extreme limits: the new state, organic registration.

This law, which I shall call the Law of Regression or of Reversion, seems to rest on facts and to be objectively true. Still, to remove all doubt and to obviate every objection, I propose to verify this law by a counter demonstration.

If memory, when failing, follows invariably the course indicated, then it must follow the reverse course when it is in process of restoration: the forms that disappear last must reappear first, for they are the most stable; and the process of restoration must be an ascending one.

It is very difficult to find cases in proof. In the first place the memory must return of its own accord: cases of re-education prove but little. Again, recovery from progressive amnesia is of rare occurrence. Finally, as attention has never been directed to this point, nothing is to be found upon it in the books. Physicians, whose attention is engrossed with the other symptoms are content to observe that memory "returns little by little."

Louyer-Villermay in his essay, quoted above observes that "memory when in process of re-establishment, follows an order inverse to that followed when in decay: events, adjectives, substantives, proper names." But little is to be drawn from this not over-precise remark.

Here is something more definite: "Lately a celebrated Russian astronomer forgot, successively, the events of the previous day, then those of the year, then those of the years last past, and so on, the chasm gradually increasing, till at last he could only recollect the events of his childhood. His case was considered hopeless; but by a sudden stop and unforeseen return, the blank was filled up in an inverted manner; the events of his youth first reappearing, then those of his manhood, and finally the more recent, those of the previous day. His memory was wholly restored at the time of his death."*

The following observation is still more to the point: the facts were noted in this instance hour by hour. I quote the greater part of the narrative: †

"I must in the first place mention two details of no great importance in themselves, but which need to be noted because they are connected with a remarkable phenomenon. Toward the end of November, an officer of my regiment suffered an injury to the left foot from the chafing of the boot. On November 30 he went to Versailles to visit his brother. He dined in Versailles and in the evening went back to Paris, and on entering his lodging found on the mantelpiece a letter from his father.

"Now for the principal fact. On December 1 this officer was at the riding school, and his horse having fallen, he was thrown to the ground, falling on his right side, particularly on his right parietal bone. The concussion was followed by a slight syncope. Coming to himself he mounted his horse again 'to get rid of a trace of giddiness,' and continued his lesson in horsemanship for three-quarters of an hour. Still he would now and then remark to the groom, 'I am coming out of a dream. What is the matter with me?' He was taken to his lodging.

"As I lived in the same house, I was summoned immediately. He was standing as I entered, recognized me, saluted me as usual, and said, 'I am like one coming out of a dream: what is the matter with me?' His utterance was unimpeded. He answered all questions rationally. He complained only of a buzzing in his head.

"Though questioned by myself, his groom and his servant, he remembered neither the injury of two days before, his journey to Versailles on the day before, his leaving the house in the morning, his orders to his domestic on going out, his fall, nor anything that followed thereafter. He fully recognized his friends, called each by name, knew that he was an officer, knew the day of the week, and so on.

"I never allowed an hour to pass without noting his condition. At every call, he always thought I had come then for the first time. He remembered none of the prescriptions he had been following—footbaths, friction, etc.; in short for him nothing existed but the action of the present moment. Six hours after the accident his pulse commenced to grow quicker and he began to retain in mind the answer so many times made to his question—'You had a fall from your horse? Eight hours after the accident, his pulse still rising, he remembered having seen me there once. Two hours and a-half later, the pulse being normal, he forgot nothing that was said to him. He then distinctly recollected the injury to his foot; and was also beginning to remember his visit to Versailles, but this in so uncertain a way that were any one to declare positively the contrary, he would have been inclined to believe him. But memory coming back more and more, he became assured during the evening that he had been at Versailles. There the progress for that day stood still. When he went to sleep, he was still unable to remember what he had done at Versailles, how he had come back to Paris, or where he had found the letter from his father.

* Taine, "Intelligence," Part 1, Bk. ii, ch. ii.

† "Observation sur un cas de perte de Mémoire," by Kœmpfen in the "Mémoires de l'Académie de Médecine," 1835, vol. iv, p. 489.

"On December 2, after a night of untroubled sleep, as soon as he awoke, he recalled in succession what he had done at Versailles, and his finding the letter on the mantelpiece. But he still knew nothing of what he had done, or seen, or heard, on December 1, prior to the accident—that is to say, he knew nothing of his own knowledge, but only what he had heard from others.

"The loss of memory was in the inverse ratio of the time that had elapsed between the several occurrences and his fall, and the return of memory was distinctly in the order from the more remote to the more recent."

This observation, made without any intention of bolstering up any hypothesis by a man who seems much surprised by the facts he records, strongly confirms our law of regression. True, this was only a case of temporary, limited amnesia; but it is seen that even within these narrow limits the law is verified. I regret that though I have searched a good deal, and made inquiries in many quarters, I am unable to lay before the reader many other cases of this kind. But when attention has been called to the matter, I hope other cases will come to light.

Our law, therefore, resting as it does on facts, and verified by this counter proof, may be held to be true till the contrary is shown. Then there are other considerations that go to corroborate it.

This law, however universal it may be with regard to memory, is but a particular expression of a still more general law—a biological law. It is a fact well known in biology that the structures that are latest formed are the first to degenerate—a fact, says a physiologist, analagous to what takes place in great commercial crises. The old houses withstand the hurricane, the new ones, less firm, are brought down on all sides. Again, in the biological world, dissolution proceeds in an order inverse to that of evolution—it proceeds from the complex to the simple. Hughlings Jackson was the first to prove in detail that the higher, complex, voluntary functions of the nervous system disappear first, and that the lower, simple, general and automatic functions disappear latest. We have seen both of these facts verified in the dissolution of the memory: what is new dies out earlier than what is old, what is complex earlier than what is simple. The law we have formulated is therefore only the psychological expression of a law of life; and pathology in turn exhibits to us in memory a biological fact.

The study of periodic amnesia has thrown new light on our subject. In teaching us how memory is constituted and how destroyed, it shows what memory is. It has revealed to us a law by which we may guide ourselves through the multitudinous varieties of diseases of memory, and which will later enable us to view them as one whole.

Without attempting a premature summary we may recall what has just been said: First of all, and in every case, there is loss of recent recollections; in periodic amnesia there is a suspension of all the forms of memory except the semi-organized and the organic; in total temporary amnesia there is complete abolition of memory, except the organic forms; in one case, that described by Macnish, there is complete abolition, including the organic forms. We shall see in the next chapter that partial disorders of memory are governed by the same law of regression, especially that most important group, amnesia of language.

The law of regression accepted, we have next to determine how it acts. On this point I shall be brief, as I have nothing to offer but hypotheses.

It were puerile to imagine that recollections are deposited on the brain in layers in the order of their priority in time, after the manner of geological strata; and that disease, descending from the surface down to the deep-lying layers, acts after the manner of the experimentalist who removes slice after slice from the brain of an animal. To explain the course of the morbid process we must have resource to the hypothesis offered above with respect to the physical bases of memory. I will state it again in a few words:

It is in the highest degree probable that recollections have the same anatomical seat as the primary impressions and that they call into action the same nerve-elements (cells and fibers). These elements may occupy very diverse positions—from the cortex of the brain to the medulla. Retention and reproduction depend, 1. On a certain modification of the cells; 2. On the formation of more or less complex groups, which we denominate dynamic associations. Such are the physical bases of memory as we conceive them.

The primary acquisitions—those dating from infancy—are the simplest, namely, the formation of automatic secondary movements, and the education of our senses: they depend principally on the medulla and on the inferior centers of the brain; and as we know, the cortex is at this period of life imperfectly developed. Came apart from their simplicity, there is every reason why they should be the most stable. In the first place the nerve-elements, when they receive these primitive impressions, are "virgin." Nutrition is in infancy very active, but this incessant molecular renovation serves only to fix the impressions, the new molecules take exactly the places of the old, and hence the acquired disposition of the nerve-elements becomes in the end equivalent to an innate disposition. Further, the dynamic associations established between these elements attains a state of perfect fusion, from being repeated innumerable times. Hence it is inevitable that these first acquisitions should be better retained and more easily reproduced than any others, and that they should constitute the most enduring form of memory.

So long as the adult individual remains in the state of normal health, his new impressions and new associations, though far more complex than those of childhood, are nevertheless very likely to be stable. The causes we have just enumerated are ever operative, though with less force.

But if through the effects of old age or of disease the conditions are changed; if the vital actions, and in particular nutrition, are weakened; if the loss exceeds the gain; then the impressions become instable and the associations are easily broken up. Take an example. Suppose a man in that stage of progressive amnesia in which recent events are very soon forgotten. He listens to a narrative, he views a landscape, or sees a show. The psychic fact is in the last analysis reduced to a sum of auditive or visual impressions forming highly complex groups. In the new story or the new show there is usually only one thing that is new—the grouping, the association. The sounds, forms, colors that make them up have been many a time experienced, and many a time remembered before. But now, owing to the morbid condition of the brain, this new complex of impressions fails to fix itself in the brain; the elements that constitute it are part of other associations or groups of far more stable character, that were formed in the period of normal health and that have been oft repeated.

The strife is very unequal between the new complex that weakly tends to establish itself in the nerve centers, and the older complexes that are firmly established. Hence all the chances are that the old combinations will be called up later, instead of the newer one. These hints must suffice. For the rest, this hypothesis as to the cause of progressive amnesia is only of secondary importance. Accepted or rejected, it in no wise affects the value of our law.

IV.

There is but little to be said of *congenital* amnesia. I will refer to it, so that nothing may be omitted. It is seen in idiots, in imbeciles, and in a minor degree in crétins. Most of the patients are afflicted with a general debility of memory. It varies according to individuals, and in some may be such as to render impossible the acquisition and retention of the simple habits which constitute the daily routine of life.

But though a general debility of memory is the rule, frequent exceptions occur in practice. Among these classes of patients there are some individuals who possess a very remarkable power of memory, within a restricted field.

It is often observed in idiots and imbeciles that their several senses are affected in very different degrees. Thus, the hearing may be extremely acute and discriminating while the rest of the senses are dull. The arrest of development is not uniform at all points. Hence it is not surprising that debilitation of the general memory should coincide, in the same man, with the evolution or even the hypertrophy of a special memory. Thus some idiots, refractory to all other impressions, have a strong liking for music, and can remember an air they have heard only once. Others—and these cases are more rare—have memory of form and color, and show a certain skill in drawing. More frequently we find memory of numbers, dates, proper names, and words in general. "An imbecile remembered the date of every burial that occurred in a parish for thirty-five years. He could repeat with unfailing exactitude the names and ages of the deceased, as also of those who had conducted the funerals. Beyond this mortuary record he had not one idea; he could not answer the simplest question, he was incapable even of serving himself with his food." Some idiots that are unable to make the simplest calculations, will repeat without a slip the multiplication table. Others will recite by heart whole pages that they have heard read from books, though they cannot name a single letter of the alphabet. Drobisch relates the following fact of which he was himself a witness: a boy of fourteen years, nearly idiotic, had great difficulty in learning to read; yet he remembered with wonderful facility the order in which the words and letters succeeded one another. Give him two or three minutes to go over a page printed in a language unknown to him, or treating of subjects of which he knew nothing, and he could from memory spell all the words there found, precisely as though the book lay open before him.* The existence of these partial memories is so common a fact that it has been turned to account in educating idiots and imbeciles.†

It is further to be remarked that some idiots subject to mania or other acute disorders regain a temporary memory. Thus, "an idiot, become a maniac, narrated a rather complex occurrence of which he had many years before been a witness, and which had seemed to make no impression upon him."‡

In congenital amnesia it is the exceptions that are instructive. Our law simply confirms the commonplace truth that the memory depends on the constitution of the brain, and in idiots and imbeciles the brain is abnormal. But the formation of these limited, partial memories helps us to understand certain dis-

* Drobisch, "Empirische Psychologie," p. 561. Dr. Herzen writes to me about a Russian, from Archangel, now twenty-seven years of age, who was stricken with imbecility at the close of a debauch. Of the brilliant faculties of his adolescence all that he retained was an extraordinary memory, so that he could instantaneously perform the most difficult operations in arithmetic or algebra, and repeat word for word long pieces of poetry after hearing them read only once.

† See Ireland's work "On Idiocy and Imbecility," London, 1877.

‡ Griesinger, op. cit., p. 431.

orders of which we have not yet treated. I am inclined to believe that the methodical study of what occurs in idiots would enable us to determine the anatomical and physiological conditions of memory. We will return to this point in the next chapter.

CHAPTER III.

PARTIAL AMNESIA.

Reduction of memory to memories—Anatomical and physiological reasons for partial memories—Amnesia of numbers, names, figures, forms, etc.—Amnesia of signs—Its nature; a loss of motor-memory—Examination of this point—Progressive amnesia of signs verifies completely the law of regression—Order of dissolution: proper names; common nouns; verbs and adjectives; interjections and language of the emotions; gestures—Relation between this dissolution and the evolution of the Indo-European languages—Counter-proof: return of signs in inverse order

I.

Before we proceed to the consideration of partial amnesia we must first remark upon the *varieties* of memory. Without such preliminary remarks the facts we are about to state would appear inexplicable. That a man should lose only his memory of words, or should forget one language, retaining others, or that a language long forgotten should come back to him suddenly, or that he should be bereft of his musical memory and of that alone—these things are so odd and strange on first view that were it not that they are vouched for by the most scrupulous observers, they might well be relegated among fables. But if, on the other hand, we have a clear idea of what is meant by the word memory, the marvelous disappears, and these facts, so far from surprising us, appear as the natural, logical consequence of a morbid influence.

The employment of the word memory as a general term is perfectly correct. It designates a property common to all sentient and thinking creatures—the possibility of retaining impressions and of reproducing them. But the history of psychology shows that there is a tendency to forget that this term, like all other terms, has a real significatlon only in particular cases: that memory resolves itself into memories, just as the life of an organism resolves itself into the life of the organs, tissues, anatomical elements that compose it. "The ancient and still unexploded error," says Lewes, "which treats memory as an independent function, a faculty, for which a separate organ, or seat, is sought, arises from the tendency continually to be noticed, of personifying an abstraction. Instead of recognizing it as the short hand expression for what is common to all concrete facts of remembrance, or for the sum of such facts, many writers suppose it to have an existence apart."*

Though every-day experience has long noted the natural inequality of the different forms of memory in one and the same person, psychologists either have not interested themselves in that fact, or have denied it on principle. Dugald Stewart seriously maintains that "original disparities among men in this respect are by no means so immense as they seem to be at first view, and that much is to be ascribed to different habits of attention, and to a difference of selection among the various objects and events presented to their curiosity."† Gall, who was the first to make a stand against this tendency, ascribed to each faculty a memory of its own, and denied the existence of memory as an independent faculty.

Contemporary psychology, more careful than the old-school psychology to omit nothing, and more concerned about exceptions that afford instruction, has brought to light a considerable number of facts which remove all doubt as to the natural inequality of the several memories in the same individual. Taine gives many excellent examples of this. We may cite in illustration Horace Vernet and Gustave Doré, painters, who can paint a portrait from memory; chessplayers who can carry on one or more games in mind; little calculating prodigies like Zerah Colburn who "see their sums before their eyes";‡ the man mentioned by Lewes who, after walking half a mile down a street, could name all the shops in their respective positions; Mozart writing the notes of the Sistine chapel *Miserere* after hearing it twice. For details I refer the reader to special treatises,‖ as I have no occasion to discuss the question here. It is enough that the reader hold these inequalities of the memory for well established. Let us now see how they are explained; we shall then see what they themselves explain.

What is implied by these partial memories? Special development of a special sense with the anatomical structures dependent on it.

To make this clearer, take a particular case—for instance a good visual memory. This has for its condition a good structure of the eye, of the optic nerve, and of the portions of the brain which concur in the act of vision—that is to say (according to the received notions of anatomists) certain portions of the pons, the crura, the optic tract, and the

* *Op. cit.*, Vol. III, p. 119.

† "Philosophy of the Human Mind."

‡ I have had occasion to note that many calculators do not see their figures nor their sums, but that they "hear" them. So far as our theory is concerned it matters little whether the images are visual or auditive.

‖ Taine, "Intelligence," vol. I, part I, Book II, ch. I, § I; Luys, "The Brain and its Functions;" Lewes, loc. cit.

hemispheres. These structures, higher by hypothesis than the average, are perfectly adapted to receive and to transmit impressions. Conseqnently the modifications which the nerve-elements undergo, as also the dynamic associations formed between them—and these, as we have often said, are the bases of memory—ought to be more stable, more definite, more easily revived, than in an ordinary brain. In short, to say that a visual organ has a good anatomical and physical constitution, is to say that it presents the conditions of a good visual memory.

We may go further, and say that the term "a good visual memory" is too broad. Daily experience shows us that one person recollects forms best, another person colors.

It is probable that the former's memory depends mainly on the muscular sensibility of the eye, that of the latter on the retina and the nervous apparatus connected with it.

These remarks apply to hearing, smell, taste, and those diverse forms of sensibility comprised under the general name of touch—in short, all sense perceptions.

If we reflect upon the close relations subsisting between the feelings, the emotions, the general sensibility, and the physical constitution of each individual, and if we consider how dependent these physical states are upon the organs of animal life, we shall understand that these organs bear the same relation to the feelings that the organs of sense do to sense perceptions. Through differences of constitution, the impression transmitted may be faint or strong, stable or transient: here are so many conditions to modify the memory of feelings and sentiments. The preponderance of any system of organs—those of generation for example—gives the superiority to one group of recollections.

There remain the higher psychic states—abstract ideas and complex sentiments. These cannot be referred directly to any organ: the seat of their production and reproduction has never been localized with precision. But as they no doubt result from an association or a dissociation of primary states, there is no ground for supposing that they are exceptional.

The foregoing remarks may be summed up thus. In the same individual an unequal development of the several senses and of the several organs produces unequal modifications in the corresponding parts of the nervous system, and consequently varieties of memory. It is probable even that inequality of memories in the same person is the rule, not the exception. As we have no exact processes for weighing and measuring them separately, and comparing them with one another, we offer the foregoing only as a conjecture. An indirect proof might be drawn from the antagonism between the different forms of memory: this is a point that might give occasion for much curious research, but it is beside our subject. * Finally, no objection can be brought from the influence of education. Of course education counts for much, but it hardly does anything more than to foster what nature has already singled out; and in certain cases it has been unable to act any part.

In psychology, as in all sciences based on facts, experience decides in the last resort. We would remark however that the relative independence of the different forms of memory might have been demonstrative by reasoning alone. In fact it is a corollary of the two propositions following, viz.: 1, Every recollection has its seat in certain determinate parts of the brain; 2, The brain and the cerebral hemispheres themselves "consist of a number of organs totally differentiated, each one of which possesses a function of its own, though it remains most closely connected with the others." This latter proposition is now accepted by most authors who study the nervous system.

In physiology indeed the distinction of partial memories is now currently received,† but in psychology the method of "faculties" has succeeded so well in having the memory regarded as a unit that the existence of partial memories has been completely forgotten or has been taken for an anomaly. It was needful that I should bring the reader back to the reality and remind him that in the last analysis there exist only special, or as some authors say, local memories. We willingly accept this latter term provided it be borne in mind that we have to do here with a distributed localization, according to the hypothesis of dynamic associations already set forth. The memory has often been compared to a store-house where all our items of knowledge are kept in separate shelves. If this simile is to be retained it must be presented in a more active form—each particular memory would be compared to a squad of employees charged with a special and exclusive branch of business. One of these squads may be dropped without throwing all the rest into confusion. This is what occurs in partial disorders of memory.

After these preliminary observations, we proceed to study the pathology of memory. If in the normal state the different forms of memory are relatively independent, it is perfectly natural that in the morbid state one form should disappear, leaving the rest intact. This fact must appear to us now as simple, and needing no explanation, resulting as it does from the very nature of memory.

* On the antagonism of memories, see Herbert Spencer, "Principles of Psychology," vol. 1.

† See in particular Ferrier, "Functions of the Brain." Even Gratiolet "Anatomie Comparée," Vol. II, p. 460, remarked that "to each sense corresponds a memory that is correlative to it, and that the mind like the body has its temperaments which result from the predominance of a given order of sensations in the natural habits of the mind."

True, many partial disorders are not restricted to only one group of recollections. This will not excite surprise if we reflect on the close solidarity of all the parts of the brain, their functions and the psychic states therewith connected. Still we shall find a certain number of cases in which the amnesia is limited.

A complete study of partial amnesia would involve the examination, one after another, of the different manifestations of psychic activity, and proving from examples that each group of recollections may disappear, whether for a time or forever. We can by no means carry out that plan. We are unable even to say whether certain forms are never partially affected, and never disappear, save when there is total dissolution of the memory. We must look to the future for fuller or more conclusive pathological proofs.

Properly speaking there is only one form of partial amnesia that may be studied thoroughly—the amnesia of signs (whether spoken or written signs, interjections, gestures.) It is rich in all sorts of facts explicable by the law formulated in the preceding chapter. Leaving that for separate study, we will state what is known with regard to other forms of partial amnesia.

"Some persons," writes Calmeil, * "have lost the power of reproducing certain sounds, or certain colors, and have had to abandon music or painting" others lose only the memory of numbers, figures, a foreign language, proper names, or the existence of their nearest relatives. We offer a few examples.

The case of Sir Henry Holland, narrated by himself in his "Mental Pathology" (p. 160), has often been quoted: "I descended on the same day two very deep mines in the Harz Mountains, remaining some hours underground in each. While in the second mine, and exhausted both by fatigue and inanition, I felt the utter impossibility of talking longer with the German inspector who accompanied me. Every German word and phrase deserted my recollection: and it was not until I had taken food and wine, and been some time at rest that I regained them again."

This case, though the one best known is far from being unique. Dr. Beattie tells of a friend of his, who having received a blow on the head, lost all he ever knew of Greek, his memory in other respects appearing to be intact. This loss of languages that have been acquired by study, has often been noted as a result of sundry fevers.

"So as regards music. A child having received a severe blow on the head, was unconscious for three days. On coming to himself he had forgotten all the music he had learned; nothing else was lost." † Other cases are more complex. A patient who had forgotten the values of the musical notes, was able to play a tune after hearing it. Another could write musical notes, even compose music and recognize a melody he heard executed; but he was unable to play with the notes before him.* These facts showing as they do the complexity of our mental operations, even of those which seem most simple, will be considered later.

In some cases the best organized recollections, the most stable, disappear momentarily, while others presenting the same character remain intact. Thus Abercrombie tells of a surgeon who having been thrown from his horse and suffered an injury in the head, gave the minutest directions upon coming to himself as to his treatment. But he no longer remembered that he had a wife and children, and this forgetfulness lasted for three days.† Is this fact to be explained on the theory of mental automatism? This surgeon, though half insensible, remembers his professional knowledge.

Some patients lose entirely the memory of proper names, even their own. We shall see later, when we come to study the amnesia of signs, in its perfect evolution—as it is seen in the aged—that these proper names are always soonest forgotten. In the cases that follow, this forgetfulness was the symptom of softening of the brain.

A certain man, unable to recall the name of a friend, had to take his interlocutor to the door on which was a plate bearing the name. Another person, after an attack of apoplexy, was unable to recall the names of any of his friends, though he designated them correctly by their ages. Mr. von B., formerly Envoy to Madrid, and afterward to St. Petersburg, was about to make a visit, but could not tell the servants his name. "Turning round immediately to a gentleman who accompanied him, he said with much earnestness, 'For God's sake, tell me who I am!' The question excited laughter, but as Mr. von B. insisted on being answered, adding that he had entirely forgotten his own name, he was told it, whereupon he finished his visit." ‡

In other instances an apoplectic attack is followed only by amnesia of *numbers*. A traveler after long exposure to cold experienced a great weakening of the memory. He could not himself make any calculation, nor retain for a moment any operation in numbers.

Forgetfulness of faces is frequent, nor need this excite surprise, for in the normal state many persons have this kind of memory very ill developed and very instable; besides, the memory of faces must be the result of a pretty complex mental synthesis. Louyer Villermay gives an amusing example:

* "Dictionnaire en trente volumes," art. *Amnesie*.
† Carpenter, "Mental Physiology," p. 443.

* Kussmaul, "Die Störungen der Sprache," p. 181. Proust, "Archives générales de médecine." 1872.
† Abercrombie, "Intellectual Powers."
‡ Forbes Winslow, *op. cit.*

"An old man being in the company of his wife imagined her to be a lady whom he had in the past been wont to visit every evening, and he would repeat again and again, 'Madam I cannot remain longer; I must return to my wife and children.'"

Carpenter tells us of a distinguished scientist whom he had known from childhood, that though turned seventy years of age he was still full of vigor, but that his memory was failing. In particular, he forgot recent occurrences and words in most frequent use. "Though continually at the British Museum, the Royal Society, and the Geological Society, he would be unable to refer to either by name, but would speak of 'that public place.' He still continued his visits to his friends, and recognized them in their own homes, or in other places (as the Scientific Societies) where he had been accustomed to meet them; but the writer, on meeting him at the house of one of the oldest friends of both, usually residing in London, but then staying at Brighton, found that he was not recognized; and the same want of recognition showed itself when the meeting took place out of doors. The want of memory of words then showed itself more conspicuously, one word being substituted for another, sometimes in a manner that showed the chain of association to be (as it were) bent or distorted. Thus, he told a friend that 'he had had his umbrella washed,' the meaning of which was gradually discovered to be that he had had his hair cut. His memory steadily declined, and he died of apoplexy."*

In this instance there is seen simultaneously existing amnesia of proper names, and names of things, and amnesia of faces; but what is most curious is the part played by the law of contiguity. Recognition of persons is not spontaneous, suggested simply by their presence. To have recognition, it must be suggested or rather aided by the actual impression of the places where they habitually are. The recollection of these places, fixed by the experience of a life-time, and become almost organic, remains stable: it serves as a fixed point to call out other recollections.

The names of these "public places" is not revived: the association between the object and the sign is too faint. But the recollection of faces is in operation, being dependent on a stable sort of association, namely contiguity in place. The one category of association that has survived assists in reviving another category, which, left to its own resources, would not have been called up.

It were an easy thing, but profitless to the reader, to enumerate cases of partial amnesia. It is enough to have shown by a few examples wherein partial amnesia consists.

The question naturally arises whether the forms of memory which disease either disorganizes for good or only temporarily suspends, are the ones that are best established, or only the weakest. We cannot answer positively. Logically, it would seem that the morbid influences must follow the line of least resistance: and the facts appear to confirm this hypothesis. In most cases of partial amnesia it is the least stable forms of memory that are attacked. At least I do not know of a single case in which, any organic form being suspended or abolished, the higher forms have remained intact. Yet it were rash to assert that this has never occurred.

We may therefore only reply to the question with an hypothesis till we shall be in possession of fuller information. For the rest it would be contrary to scientific method to refer to one law all sorts of cases depending on special conditions. A thorough study of each case and its causes is necessary before we can declare them all to be reducible to one formula. Just now the problem is too obscure to permit of this being done.

The same remarks apply to the process by which these forms of amnesia are produced. In the first place we know nothing about the physiological mechanism special to each form. Here all means of explanation fail us. As regards the psychological mechanism we may venture an hypothesis. In the cases of partial amnesia we have been considering there are two things in particular worthy of note, viz., destruction and suspension. Destruction is the direct result of the disorganization of the nerve-elements. In the case of suspension a certain group of elements remains temporarily isolated and powerless, or, in psychological language, it stands outside of the mechanism of association. This explanation is suggested by the case cited by Carpenter. The solidarity existing between the different parts of the brain, and consequently between the different psychic states persists, as a rule. These groups alone, with the sum of recollections that they represent, are in a manner made immobile, inaccessible to the other groups, incapable for a time of entering into the consciousness. This state must be the result of physiological conditions which escape our notice.

II.

We have reserved for special study one form of partial amnesia—that of *signs*. Here we use the term *signs* in its broadest sense, comprising all the means man employs for expressing his feelings and thoughts. The subject is one that is clearly defined and rich in facts at once like and unlike, inasmuch as they possess a common psychological character in that they are signs, while they differ as to the nature of the signs, which are either vocal or written signs, gestures, drawings, or music. They are easily observed and of every-day occurrence, and well localized; and owing to their variety they are well suited for comparison and analysis. Besides, as we shall see, this species of par-

* *Op. cit.*, p. 545.

tial amnesia very strikingly confirms the law of the destruction of memory laid down in the preceding chapter in its most general form.

But first we must guard against a misunderstanding. The reader may suppose that we are about to study aphasia: but not so. In most cases, aphasia, it is true, implies a disorder of the memory, but it implies something more; and it is only with disorders of memory that we are concerned. The researches made during the last forty years upon the diseases of the faculty of language, have shown that under this one term, aphasia, are included cases that differ very widely from one another. The reason is that aphasia being, not a disease, but a symptom, varies according to the morbid conditions that produce it. Thus, some aphasic subjects are deprived of every mode of expression; others are able to speak but not to write, or *vice versa;* the loss of gesture is much less frequent. Sometimes the patient retains a pretty considerable vocabulary of vocal and graphic signs, but speaks and writes in counter-sense (paraphasia, paragraphia). Or he does not understand the signification of words whether written or spoken, though hearing and sight be intact, (word-deafness, word-blindness). Aphasia is either permanent or transitory: oftentimes, it is accompanied by hemiplegia. This hemiplegia—which nearly always attacks the right side—is in itself, quite apart from amnesia, an obstacle to writing. * These principal forms present varieties according to the individuals affected. From this, the reader may have some idea of the complexity of the question. Fortunately, we have not to discuss it here. Our task—and it is one of no little difficulty—consists in determining among these disorders of speech and of the expressive faculty in general, that which seems to belong to memory alone.

Plainly, we have nothing to do with cases where aphasia results from idiocy, dementia, or loss of memory in general; neither with cases where the power of transmission alone is impaired: thus a lesion of the *white* matter of the brain, in the neighborhood of the third left frontal convolution may impair the expressive faculty, the gray matter being intact.† But after these two causes are eliminated, the difficulty is hardly lessened, for aphasia usually occurs under quite other conditions. We will examine it under its most ordinary form.

There is no need to cite instances, which the reader may find everywhere. ‡ Usually, aphasia appears suddenly. The patient is unable to speak; if he tries to write, there is a like inability; at best he is able, with great difficulty, to trace a few unintelligible words. His physiognomy retains the look of intelligence. He strives to convey his meaning by gestures. For the rest, there is no paralysis of the muscles that serve to articulate words; the tongue moves freely. Such are the general traits, at least the ones which most interest us just now.

What has occurred in the psychic state of the patient, and, as regards the memory, what is it that he has lost? A little reflection suffices to show that amnesia of signs is a phenomenon of quite a special character. It is not to be compared to the forgetfulness of colors, sounds, a foreign language, or a period of life. It extends to all the activities of the mind, and so far forth it is general; and yet it is partial only, for the patient retains his ideas and his recollections, and is conscious of his own situation.

In our opinion, the amnesia of signs is above all a disease of the *motor memory:* that it is which gives it its special character and makes it assume for us a new aspect. But what is meant by "motor memory," an expression which may at first cause surprise? The matter has been so little studied by psychologists, that it is difficult to discourse of it clearly in a summary way, and it cannot be treated here at any length.

I have endeavored in another place,* though not with sufficient fullness, to show the psychological importance of movements, and to prove that every state of consciousness implies in some degree motor elements. But to confine ourselves to the matter in hand, I would remark that no one finds difficulty in admitting that our perceptions, our ideas, our intellectual acts in general are not fixed in us, and have no part in memory except there exist in the brain certain residua—modifications of nerve-elements and of the dynamic associations of those elements. On this condition alone are they retained and recalled. But the same must of necessity hold good for movements. The movements under consideration, those which take place in articulate speech, writing, drawing, music, gestures, can be retained and reproduced only on condition that there are motor residua, *i. e.*, according to the hypothesis so often set forth, modifications in the nerve-elements and dynamic associations between those elements. But whatever opinion one may adopt, if nought remained of a word spoken or written for the first time, it were impossible either to read or to write.

* In left-handed subjects of aphasia the hemiplegia is always on the left side.

† For cases of this kind, see Kussmaul, "Die Störungen der Sprache," p. 99.

‡ The literature of aphasia is so plentiful that a simple enumeration of works or memoirs would occupy several pages. For the psychological aspects, the reader may consult Trousseau, "Clinique Médicale," vol. II; Fabret, art. "Aphasia" in "Dict. encycl. des sciences médic;" Proust, "Archives gén. de méd," 1872; Kussmaul, *ubi supra;* H. Jackson, "On the Affections of Speech," in *Brain*, 1878, 1879 1880, etc.

* "Revue Philosophique," Oct., 1879; see also an excellent chapter of Maudsley's work, "Physiology of Mind."

The existence of motor residua admitted, we may understand the nature of sign-amnesia.

Our intellectual activity consists, as we know, in a series of states of consciousness associated according to certain relations. Each term of a series seems to the consciousness simple, but it is not so in reality. When we speak or think with anything like precision, all the terms of a series form couples, made up of the thought and its expression. In the normal state the fusion of these two elements is so complete that they form one, but disease shows that they can be dissociated. Further, the expression "couple" does not suffice. It is exact only for that portion of the human race that cannot write. When I think of a house, over and above the mental representation which is the state of consciousness proper, over and above the vocal sign which translates that thought and which seems to form one thing with it, there exists a graphic element that is almost as intimately blended with the thought, and which, when I write, becomes even predominant. Nor is that all: around the vocal sign, "house," are grouped, by a less intimate association, the vocal signs used in other languages with which I am acquainted—*maison*, *domus*, *Haus*, *casa*, etc. Around the graphic sign, "house," are grouped the graphic signs of those same languages. Thus we see that in an adult mind, each clear state of consciousness is not a simple unit, but a complex unit, a group. The mental representation, the thought, is, properly speaking, only the nucleus, around which are grouped signs more or less numerous which determine it.

This understood, the mechanism of sign-amnesia becomes clearer. It is a pathological state in which, the idea being intact or nearly so, a part of the signs or all the signs which translate it are temporarily or forever forgotten. This general proposition must be completed by a more detailed study.

1. Is it true that in aphasic subjects, thought subsists, while its verbal and graphic expression has disappeared?

I would remark that it is not incumbent on us to inquire here whether one can think without signs. The question we have to discuss is altogether different. The aphasic subject has for a long time been using signs: do his ideas disappear with the power of giving them utterance? The facts answer in the negative. Though authors are unanimous in declaring that aphasia, especially when it is of long standing and of a serious character, is always accompanied by a certain decline of mental power, there is no doubt that mental activity persists even when it has no other mode of expression but gestures. Instances abound, but I will cite only a few.

Some patients deprived only of a portion of their vocabulary, but unable to find the right word, substitute for it a paraphrase or a description. For "scissors" they will say "what you cut with;" for window, "what you see through." They will designate a person by the place he lives in, by his titles, his occupation, his inventions, the books he has written.*

In more serious cases we see patients playing cards with considerable caution and reflection: others again are able to superintend the management of their business. Thus we have a great proprietor mentioned by Trousseau, "who by means of signs intelligible to those around him directed the leases and deeds to be laid before him, pointed out modifications to be made in them, and in most cases these modifications were useful and based on sound judgment." A man who was totally deprived of the power of speech, sent to his doctor a detailed account of his trouble written by himself in very correct language, and in a very firm hand.

We have furthermore the testimony of patients themselves after their recovery. "I had forgotten all words," says one, "but I retained fully my consciousness and my will. I knew very well what I wanted to say, but could not. When you," (the physician), "asked me a question, I understood you perfectly; I made all sorts of efforts to repiy, but it was impossible to recall the words."† Rostan, on being stricken suddenly so that he was unable either to speak or to write a single word, "analyzed the symptoms of his disease and sought to refer them to some special lesion of the brain, just as he would have done in a clinical lecture." Lordat's case is well known: "He was capable of arranging in his mind the matter of a lecture, of altering the distribution of the several headings; but when his thoughts had to be uttered in speech or in writing, it was found to be impossible, though there was no paralysis." ‡

We may therefore regard it as proven that, all means of expression having disappeared, the intelligence remains almost intact, and consequently that the amnesia extends only to signs.

2. Does this amnesia depend, as we have said it does, *especially* upon the motor elements? When on a preceding page we endeavored to prove the necessary existence of motor residua, we did not examine the problem in all its complexity. We must return to it:

When we are learning to speak our mother tongue or a foreign language, certain sounds, acoustic signs, are registered in the brain. But that registration is only a part of the

* Very often the aphasic patient confounds words, and says "fire" when he means "bread," or even coins words that are unintelligible. But these disorders seem to me to be rather a language-disease than a disease of memory.

† Legroux, "De l'aphasie," p. 96.

‡ For the facts see especially Trousseau, *op. cit.* Lordat, who is a strong spiritualist, (*i. e.*, advocate of the doctrine of an immaterial principle or soul in man), has from these cases drawn conclusions favoring the independence of mind.

task, for we have to repeat these signs, to pass from the receptive to the active state, to translate these acoustic signs into vocal movements. This operation is at first very difficult, for it consists in co-ordinating movements that are very complex. We are able to speak only when these movements are readily reproduced, that is, when the motor residua have been organized.

In learning to write we fix our eyes on the copy; optic signs are thus registered in the brain; then, with much effort we strive to reproduce these by the motions of the hand. Here, too, there is co-ordination of very complex movements. We are able to write only when the optical signs are immediately translated into movements, that is, when the motor residua are organized.

The same is to be said of music, drawing, acquired gestures, (for instance, those taught to deaf mutes). The expressive faculty is more complex than it seems to be. Our thoughts and feelings have need of an acoustic (or optical) memory—a motor memory. Now, what is there to prove that it is precisely this motor memory that is affected in cases of amnesia of signs?

Consider the phenomena observable in most cases of aphasia. Present to the aphasic subject any familiar object, for instance a knife, and call it by some other name, as *fork*, *book*, etc.; he will contradict you. Pronounce the true name and he expresses assent by gesture. If you ask him then and there to repeat the name, it is but seldom that he will be able to do so. Therefore, he has retained not only the idea but also its acoustic sign; for this he recognizes among many other signs. But since he cannot translate it into speech, though his vocal organs are intact, it follows that the amnesia must affect the motor elements.

The same experiment may be made with regard to writing. Among aphasic subjects, who are not paralyzed, it leads to the same results. The patient retains the memory of the optical signs, but has lost the memory of the movements necessary for their reproduction. Some patients can copy, but when the original is taken from them they are helpless.

However, while I hold that motor amnesia exists in most cases, I do not claim that it is always present. In so complex a subject, it is best not to pronounce absolutely. When the aphasia is irremediable we sometimes find the patient forgetting the vocal or written signs, or recognizing them only with great difficulty and with much hesitation. In such cases amnesia is not restricted to the motor elements. Again, some aphasic patients can, as we have seen, repeat a word or copy it; others can read aloud, though they are unable to speak in conversation. This is an exceptional case (Falret, p. 618). On the other hand, many can read to themselves, though unable to read aloud. It has happened, though rarely, that an aphasic patient would utter spontaneously one portion of a phrase, and then be unable to continue. Brown-Séquard cites even the case of a physician who spoke in his dreams, though aphasic in the waking state. These facts, infrequent though they be, show that motor amnesia is not always absolute. It is with this form of memory as with all other forms: under certain exceptional circumstances it revives.

We may in passing note an analogy. The aphasic patient who succeeds in repeating a word, exactly resembles one who is unable to recall an occurrence save with the assistance of other persons: the psychological mechanism of the amnesia of signs is the same as for all other kinds of amnesia. It consists of a dissociation: a fact is forgotten when it cannot be awakened by an association, when it cannot enter into any series. In aphasia the thought no longer calls forth its appropriate sign, or at least its motor expression. Here however, the dissociation is more complete: there is dissociation not only between *terms* united by prior experience, but between *elements* so knit together that they form for consciousness a unity; to assert their relative independence of one another would seem to be mere hair-splitting were it not demonstrated by pathological facts. *

It is this perfect fusion of the thought, the sign (whether vocal or written) and the motor element which makes it so difficult to prove clearly and indisputably that sign-amnesia is mainly motor amnesia. As every state of consciousness tends to translate itself into motion; and as, according to Bain's happy phrase, to think is to restain oneself from speech or action, it is impossible by analysis alone to draw clear lines of demarkation between these three elements. Still it appears to me that the memory of vocal and written signs which survives in the intelligent aphasic patient, represents fairly what has been called the inner speech, that minimum of ideation without which the mind would be on the way toward dementia; and consequently that the motor elements alone are suppressed in sign-amnesia.

On consulting what has been written by physicians who have studied the psychology of amnesia, and they are but few, I find that their doctrine differs in hardly any respect from that here set forth, save in terminology. "I have asked myself," says Trousseau, "whether [aphasia] is not simply a forgetting

* Authors have in late years carefully described under the name of "Word-blindness" (Wordblindheit) and "Word-deafness" (Worttaubheit) maladies that have long been confounded under the general designation of Aphasia. The patient is able to read and write; sight and hearing are well retained, and yet the words he reads or hears spoken have for him no meaning. For him they are simply optical or acoustic phenomena and are no longer signs. This is another and rarer form of dissociation. Kussmaul gives details. Op. cit. chap I. 27.

of the instinctive and harmonic movements which we learned in early childhood, and which constitute articulate language; and whether, owing to this forgetting, the aphasic patient is not in the condition of a babe who is learning to babble his first few words, or of a deaf mute who, suddenly cured of his deafness, strives to imitate the speech of those whom he hears for the first time. The difference between the asphasic patient and the deaf mute then would be that the one has forgotten what he had learned and that the other has not yet learned at all." (Op. cit. p. 718.

To the same effect Kussmaul: "If we consider memory as a general function of the nervous system, then, in order that the sounds be combined to make words, there must be both an acoustic and a motor memory. Thus the memory of words is a double memory, first a memory of words as far as they constitute a group of acoustic phenomena, and second a memory of words as motor images. (Bewegungsbilder)".

It has been justly remarked by Trousseau that aphasia is always reducible to loss of the memory either of vocal signs or of the means whereby we articulate words. W. Ogle also distinguishes two word-memories, one universally known, whereby we have consciousness of a word, and the other whereby we give expression to it." (Op. cit. p. 156).

Is there any ground for affirming that the residua which correspond to an idea, those which correspond to its vocal or graphic sign and to the movements which translate both of these, have their seats side by side in the cortex? What anatomical inferences are to be drawn from the fact that one may lose memory of movements without losing memory of the inner signs of speech, these without that of writing, or of writing without that of speech? Are the motor residua located in Broca's convolution, as some authors appear to hold? We can only state these questions; it is not for us to answer them. The relation between the sign and the idea, simple as it appears to the psychologist who follows the subjective method, is highly complex for the positive psychologist, who is helpless until anatomy and physiology have made further progress.

We have now to consider sign-amnesia under another aspect. We have studied it in itself, we will now study it in its evolution. I have endeavored to show that it affects especially the motor elements, and that this gives it its distinctive character: whether this be accepted or not does not concern what follows.

Sometimes the aphasia is of brief duration. Anon, it becomes chronic, and in seeing the patient after an interval of some years we notice no appreciable change. But there are cases where fresh apoplectic attacks increase the intensity of the malady, and then its course is progressive: such cases are of higher interest from our point of view. There is a gradual breaking up, and the memory of signs declines little by little in a certain fixed order. Briefly stated, the order is, first, words, that is, rational speech; second, exclamatory phrases, interjections, what Max Müller calls "emotional language;" third, (in very rare cases), gestures.

We will examine in detail these three stages of dissolution; we shall thus have considered amnesia of signs in its totality.

1. The first stage is by far the most important, as it comprises the higher forms of language, those which are distinctively human, which express deliberate thought. Some physicians, even prior to the contemporaneous researches in aphasia, have remarked that all other things being equal, the memory of proper names is lost earlier than that of common nouns, and that the loss of common nouns precedes the loss of adjectives. This observation has since been confirmed by sundry investigations. "Substantives," says Kussmaul, in his latest work, "and in particular proper and concrete names (*Sachnamen*) are more readily lost than verbs, adjectives, conjunctions, and other parts of speech."* This fact has been noted only incidentally by medical men, and very few of them have inquired into its causes. In fact it possesses for them no clinical interest, while it is highly important for the psychologist.

We see at the first glance that amnesia progresses from the particular to the general. It first affects proper names, which are purely individual, then the names of things, next all substantives which are but adjectives in a special signification;† lastly, adjectives and verbs expressive of qualities, modes of being, acts and the like. The scholar mentioned by Gratiolet, who, having forgotten all proper names, was wont to say, "My associate who made such or such an invention," designated persons by their qualities. It has also been observed that idiots often have no memory save for adjectives. The idea of quality is the most stable, because it is the one first acquired, and because it is the basis of our most complex conceptions.

Now, since the particular is that which has least extension, and the general that which has most, we may say that the rapidity with which the memory of signs disappears is in inverse ratio to their extension; and since, *cæteris paribus*, a term has all the better chance of being repeated and fixed in the memory in proportion as it designates a greater number of objects, and all the less chance of being repeated and fixed in the memory in proportion as it designates only a few objects, we see that this law of dissolution rests in the last resort upon experimental conditions.

* "Die Störungen der Sprache," p. 164.

† The transformation of adjectives into substantives, one of the constant processes in the formation of languages, is still to be seen. Thus, we speak of a "special" meaning, "special" correspondent, a "brilliant," etc.

As a complement of these remarks, I will quote a passage from Kussmaul: "When the memory is failing, the more concrete an idea is, the more quickly is the term that expresses it lost. The reason of this is that our mental images of persons and things are more loosely connected with their names than are abstract notions, such as their condition, their relations, their qualities. We easily figure to ourselves persons and things without their names, because here the sensorial image is more important than that other image which is the sign, in other words their name. On the other hand, we do not acquire abstract ideas save by the aid of words which alone give to them a suitable form. Hence it is that verbs, adjectives, pronouns, and particularly adverbs, prepositions and conjunctions are more intimately associated with thoughts than are substantives. It may well be conceived that in the network of the corticul cells, many more phenomena of excitation and combination occur in the case of an abstract idea than in that of a concrete one, and that consequently the organic connections that attach an abstract idea to its sign are far more numerous than in the case of a concrete idea" (op. cit. p. 164). Translated into psychological language, this last phrase amounts to what we have already said, namely, that the stability of the sign is as its organization, *i. e.*, as the number of experiences repeated and registered.

The science of language also furnishes us with very valuable data. At the risk of wearying the reader by a superabundance of proof, I must take note of these. As was to have been expected, the evolution of language has followed an order inverse to that of the loss of language in aphasia.

Before we cite in favor of our law the historic development of languages, it might seem natural that we should ascertain the process of language development in the individual. That, however, is impossible. When we are learning to speak, our language is given to us ready-made. Though the babe, as has been well observed by Mr. Taine, "learns a language already made, as the true musician learns counterpoint, or the true poet prosody; in other words, as an original genius," still in reality he creates nothing at all. We must therefore confine ourselves to the historical evolution of language.

It is certain that the Indo-European languages are descended from a certain number of roots, and that these roots were of two kinds, namely, verb or predicative roots, and pronominal or demonstrative roots. The former, comprising verbs, adjectives and substantives are, says Whitney, signs indicating acts or qualities. The others, whence come the pronoun and the adverb (the preposition and conjunction are of secondary formation), are few in number, and denoted relative position. The original form of language signs therefore is the attribution of qualities. Then the verb and the adjective became discriminated. "Nouns are derived from verbs through the participles, which are only adjectives whose derivation from verbs is not yet obliterated."* As for the transformation of common nouns into proper nouns, that admits of no question. Does not the natural evolution of language explain the stages of its dissolution in aphasia, in so far as we may compare a spontaneous creation with the decay of a language artificially acquired?

2. In setting forth in its most general form the law of the regression of memory, we have seen that the memory of feelings is effaced later than the memory of ideas. Logic leads us to infer that in the case we are considering —progressive sign-amnesia—the language of the emotions must disappear later than the language of the reason. Facts fully confirm this deduction.

The most careful observers—as Broca, Trousseau, Hughlings Jackson, Broadbent —have noted a great number of cases where aphasic patients entirely deprived of speech, incapable of articulating spontaneously a single word, are able to utter not only interjections, but also complete phrases, brief habitual sentences expressive of anger or vexation, or of pain for their privation. One of the most persistent forms of such emotional language is that of profanity.

We have said that generally that which is of recent formation dies out first, whatever is of old formation disappears last. The remark is confirmed by what we see here: the language of the emotions is formed before that of ideas; it disappears later. So, too, the complex disappears earlier than the simple: and rational language, compared with the language of the emotions, is exceedingly complex.

3. All the foregoing remarks are applicable to gestures. That form of language—and it is the most natural of all—is, like the interjection, only a reflex mode of expression. It appears in the babe long before articulate language. Among some savage tribes stricken with arrest of development, gestures play as important a part as words. This inborn form of language is seldom lost. "Cases of aphasia in which disorders of the mimic faculty occur are always," says Kussmaul, "of an exceedingly complex character. In such cases the patients sometimes are conscious that they err in the use of gestures, sometimes again they are not." (*Op. cit.* p. 160).

Hughlings Jackson, who has carefully studied this subject, notes that some aphasic subjects can neither laugh nor smile, nor cry except in case of extreme emotion. Further he has noted that some patients express affirmation or negation by purely chance gestures: one of them, who had still at his command a few interjections and a few gest-

* Baudry, "La Science du Langage," p. 16. For fuller details consult the works of Max Müller and Whitney.

ures, employed them in a contrary sense, in an unintelligible way.

Trousseau gives a very remarkable instance of pure motor amnesia affecting gestures: "I would raise both hands and move my fingers, as though playing the clarionet, and tell the patient to do the same. He forthwith would perform these movements with perfect precision. 'You see,' I would say, 'I am acting as though I played the clarionet,' to which he would signify assent. After a few minutes I would ask him to execute the movement again. He would deliberate, but in most instances it was impossible for him to perform this very simple piece of mimicry."

Thus, then, we have seen that sign-amnesia proceeds from proper nouns to common, thence to adjectives and verbs, and finally affects the language of the emotions, and gesture. This destructive process does not advance at random, but follows a fixed order, from the less organized to the better organized, from the complex to the simple, from the less to the more automatic. What was said above when we laid down the general law of the reversion of memory might be repeated here, and it is one evidence of its correctness that it is verified in sign-amnesia, the most important, the most systematic and the best-known form of partial amnesia.

We may now proceed to give a counter-proof. When the amnesia of signs is complete and memory is gradually coming back, does this process follow an order inverse to that of the disappearance of memory? Instances of recovery are rare. I find one case, however, mentioned by Dr. Grasset, where a man was seized with "entire disability to express his thoughts whether in words, or in writing, or by gestures. Some days later his power of making himself understood by gestures was seen to return little by little—then successively the power of expression by means of words, and finally by means of writing."* It is highly probable that other instances might be found were the attention of observers directed to this point.

CHAPTER IV.

EXALTATION OF MEMORY, OR HYPERMNESIA.

General excitation—Partial excitation—Return of lost memories—Return of forgotten languages—Reduction of this fact to the law of regression—Case of false memory—Examples and a suggested explanation.

Hitherto, our pathological study has been limited to cases of impairment of memory. But there are cases of a very different kind, where that which seemed to have been destroyed revives and faint recollections recover their original intensity.

Is this exaltation of memory, called by physicians hypermnesia, a morbid state? It is at least an anomaly; and since it is always associated with some organic trouble or some singular and unusual condition, it unquestionably belongs to our subject. It is a less instructive object of study than amnesia, but it must not on that account be omitted. Besides, as we shall see, it teaches us something about the persistence of recollections.

Excitations of memory are either general or partial.

I.

General excitation of memory is not easy to determine, the degree of excitation being relative. We should have to compare memory with itself in the same individual. Since the power of this faculty differs widely between different persons, there is no common measure; the amnesia of one person may be the hypermnesia of another. It is in fact a change of *tone* occurring in the memory, such as may occur in any other form of psychic activity; whether thought, imagination, or sensibility. Again, when we say that the excitation is general, that is merely a probable induction. As memory is subject to the condition of consciousness, and as consciousness exists only in the form of a series, all that we can prove is simply that during a longer or shorter period a multitude of recollections arise on all sides.

General excitation of memory seems to depend entirely on physiological causes, and in particular upon the rapidity of the cerebral circulation. Hence, it is of frequent occurrence in high fevers. It also occurs in cases of mania, ecstasy, hypnotism, occasionally in hysteria, and in the incubation-period of some brain diseases.

Besides these strictly pathological cases, there are others of a more unusual character which probably depend on the same cause. Thus, there are narratives of drowning persons saved from imminent death, all of which agree on this point, viz., that "when asphyxia began, the drowning person seemed to review in an instant the whole of his past life with all its little details." One man affirmed that "every instant of his former life seemed to glance across his recollection in a retrograde succession, not in mere outline, but the picture being filled with every minute and collateral feature forming a kind of panoramic picture of his entire existence, each act of it accompanied by a sense of right and wrong."

Under analogous circumstances, "a man of remarkably clear head was crossing a railway in the country when an express train, at full speed, appeared closely approaching him. He had just time to throw himself down in the center of the road between the two lines

* "Revue des Sciences Médicales," 1873, vol. ii, p. 684.

of rails, and as the train passed over him, the sentiment of impending danger to his very existence brought vividly to his recollection every incident of his former life in such an array as that which is suggested by the promised opening of 'the great book at the last great day.'" *

Even when we make allowance for exaggeration, these facts reveal to us a superactivity of memory of which we can have no idea in the normal state.

I will quote one more instance due to opium intoxication, and I beg the reader to note how this confirms the explanation already given of the mechanism of recollection. Says Thos. De Quincey: "I sometimes seemed to have lived for seventy or one hundred years in one night. * * * The minutest details of childhood, or forgotten scenes of later years, were often revived. I could not be said to recollect them, for if I had been told of them when waking I should not have been able to acknowledge them as parts of my past experience. But placed as they were before me, in dreams like intuitions, and clothed in all their evanescent circumstances and accompanying feelings, I *recognized* them instantaneously." †

All these general excitations of memory are transitory, never outliving the causes that produce them. Is there a permanent form of hypermnesia? If the term may be used in rather wide sense, we might apply it to the curious development of memory that follows certain injuries. Upon this point we find in old authors stories that are now controverted; instance the cases of Pope Clement VI., Mabillon, and others. There is no reason to question these stories, for modern observers, Romberg among them, have noticed a remarkable permanent development of memory as the result of brain concussion, smallpox, etc. The mechanism of this change being inscrutable, we need not dwell upon it.

II.

Partial excitations of memory are, by their very nature, definitely limited. When the habitual tone of the memory is as a whole preserved, whatever goes beyond that is easily ascertained. Such hypermnesia is the necessary correlative of partial amnesia; it proves again and under a new form that memory is made up of *memories*.

We find nothing resembling a law in the production of partial hypermnesia. It manifests itself in isolated facts, that is to say as the result of a concurrence of conditions which elude observation. Why is one group of cells forming one particular dynamic association affected rather than another? No reason can be given, whether physiological or psychological. The only instances in which there is any appearance of law are those to be mentioned further on, where several languages come back successively to the memory.

Partial excitation most usually results from morbid causes: these have been already indicated. But sometimes it occurs in the state of health. Here are some examples: "A lady in the last stages of a chronic disease was carried from London to a lodging in the country; there her infant daughter was taken to visit her, and after a short interview carried back to town. The lady died a few days after, and the daughter grew up without any recollection of her mother till she was of mature age. At this time she happened to be taken into the room in which her mother died, without knowing it to have been so; she started on entering it, and when a friend who was along with her asked the cause of her agitation, she replied: 'I have a distinct impression of having been in this room before, and that a lady who lay in that corner and seemed very ill, leaned over me, and wept.'"

A clergyman, of marked artistic temperament (this is worthy of note), went with a party of friends to visit a castle in Sussex, which he had no recollection of having ever seen before. "As he approached the gateway, he became conscious of a very vivid impression of having seen it before; and he 'seemed to himself to see' not only the gateway itself, but donkeys beneath the arch, and people on the top of it. His conviction that he *must* have visited the castle on some former occasion made him inquire from his mother if she could throw any light on the matter. She at once informed him that, being in that part of the country when he was about *eighteen months* old, she had gone over with a large party and taken him in the pannier of a donkey; that the elders of the party, having brought lunch with them, had eaten it on the roof of the gateway where they would have been seen from below, while he had been left on the ground with the attendants and donkeys." †

The mechanism of remembering in these two instances leaves no room for question: it is a revival of memories produced by nearness in space. They simply present in a more striking and less accustomed way that which we see every moment of our lives. Who is there that, in order to regain a recollection that he has for the moment lost, has not gone back to the place where the thought first presented itself, thus placing himself as nearly as possible in the same material situation, and so bringing back the recollection in an instant?

As for hypermnesia due to any morbid cause, I will cite only one instance, which will serve as a type: "A boy, at the age of four, received a fracture of the skull, for

* For these cases and others of like nature, see Winslow, *op. cit.*, p. 333, *et seq.*

† "English Opium-Eater."

* Abercrombie, "Essay on the Intellectual Powers," p. 120.

† Carpenter, loc. cit., p. 431.

which he underwent the operation of trepan. He was at the time in a state of perfect stupor, and after his recovery retained no recollection either of the accident or of the operation. At the age of fifteen, during the delirium of a fever, he gave his mother a correct description of the operation, and the persons who were present at it, with their dress and other minute particulars. He had never been observed to allude to it before, and no means were known by which he could have acquired the circumstances which he mentioned."*

The recovery of languages that have been quite forgotten, may well engage our attention for a moment. The case recorded by Coleridge is so well known that I shall not speak of it. There are many other cases of the same kind to be found in the works of Abercrombie, Hamilton and Carpenter. The anæsthetic sleep produced by chloroform or ether may produce the same effects as febrile excitation. "An aged forester had lived in early life on the Polish frontier and there had spoken Polish almost exclusively. Later he lived only in German districts. His children said that for thirty or forty years he had neither heard nor spoken a word of Polish. During two hours of anæsthesia, he spoke, uttered prayers, and sung only in Polish. †

Still more curious than the recovery of one language is the retrogressive return of many languages. Unfortunately the authors who have written about this fact, report it simply as a matter of curious interest, without stating all the particulars needed for its interpretation.

The most clearly defined case is the one observed by Dr. Rush, of Philadelphia, and recorded in his "Medical Inquiries and Observations upon Diseases of the Mind." "Dr. Scandella, an ingenious Italian who visited this country a few years ago, was master of the Italian, French and English languages. In the beginning of the yellow fever, which terminated his life, he spoke French only; but on the day of his death he spoke only in the language of his native country."

The same author writes in rather confused terms of a woman subject to attacks of temporary insanity. First she spoke in broken Italian; at the crisis of her disorder, in French; when the fever was abating, in German; when she was beginning to convalesce, she returned to English, her mother tongue.

Quitting these cases of regression through many languages, and turning our attention to simpler cases, we find an abundance of indisputable testimony. A Frenchman living in England and speaking English fluently, received a blow on the head. During his illness, he was able to answer questions only in French.

But there is no case more instructive than one recorded by Dr. Rush. I have it, he says in substance, from a German Lutheran minister residing in America, and who had in his congregation a considerable number of Germans and Swedes, that when at the point of death they nearly all utter their prayers in their mother tongue. In visiting old Swedes upon their death-beds he was "much struck in hearing some of them pray in the Swedish language, who, he was sure had not spoken it for fifty or sixty years before, and who had probably forgotten it."

Winslow too notes how Catholics converted to Protestantism, during the delirium which precedes death, pray almost exclusively in the Roman formulas. *

This return of forgotten languages and formulas, properly undersood, is simply a special instance of the law of regression. In consequence of a morbid action that usually ends in death, the most recent memory-deposits are first destroyed, and the work of destruction proceeding by degrees to the earliest acquisitions which are also the most firmly grounded, gives to them a momentary activity and then effaces them forever. Hypermnesia therefore is simply the result of conditions entirely negative; regression results, not from a normal return to consciousness, but from the suppression of more vivid, more intense states. These revived memories are like a feeble voice that can make itself heard only when more powerful voices are stilled. These acquisitions and habits of childhood or of youth come into the foreground, not because there is anything urging them to the front, but because there is nothing any longer to overlie them. Reviviscences of this kind are, strictly speaking, only a reversion back to conditions of existance that seemed to have vanished forever, but which the work of demolition brings to light again. I refrain however from the reflections that these facts so naturally suggest, and leave them for the moralist. He will be able to point out for instance how certain religious reversions occurring in the last moments of life, and which make so much noise in the world of polemics, are but the necessary effect of irremediable dissolution.

Independently of this unexpected confirmation of our law of regression, the outcome of our study of hypermnesia is a knowledge of the surprising persistence of those latent conditions of recollection which have been called "residua." But for these disorders of memory, we should not have suspected their existence, for consciousness, of itself, can only affirm the conservation of the states which constitute our everyday life and of certain other states which the will holds in dependence upon itself, because habit has fixed them.

Are we to infer from the fact of these reviviscences that nothing is lost from the

* Abercrombie, *op. cit.*, p. 149.

† Duval, art. Hypnotisme, in "Nouveau Dict. de Médecine," p. 144.

Op. cit. p. 253; see also p. 265, 266, 305.

memory? That whatever is once registered therein is indestructible, and that even the most transient impression may at one time or another be revived. Many authors, Maury in particular, have contributed striking examples in support of this opinion. But should any one maintain that, even in the absence of morbid causes, some residua disappear, there is nothing known whereby he might be peremptorily refuted. Possibly some cellular modifications and some dynamic associations are too instable to last. Still it may be said that persistence, if not the rule without exceptions, is nevertheless the rule: it embraces the great majority of cases.

Of the mode in which these old-time recollections are preserved and reproduced, we know nothing, but I may point out how this might take place on the hypothesis set forth in the present work.

If we accept as the material substratum of our recollections cell modifications and dynamic associations, any memory, however burdened it may be with impressions, may keep them all. For though cell modifications are limited in number, dynamic associations are innumerable. We may suppose that the old associations reappear when the new ones, disorganized for a time or permanently, leave the field clear for them. The number of possible reviviscences being much reduced, the chances are proportionately increased for the return of the more stable, *i. e.*, the oldest associations. But I will not dwell on an hypothesis that cannot be verified. I desire to confine my observations to that which can be ascertained.

We cannot refer to any of the preceding morbid types one illusion of a singular character, one besides that is of rare occurrence or seldom observed. Three cases of this illusion only are on record, and no specific name has been offered to designate it. Wigan has called it, inaptly enough, double-consciousness, and Sander defines it to be an illusion of memory (*Erringerungstauschung*). Other authors have given it the name of false memory, and this seems to me to be preferable. It consists in a belief that a state of consciousness that in reality is new was experienced before, so that when it first occurs it is thought to be a repetition.

Wigan in his well-known work, "Duality of the Mind," states that while he was attending the obsequies of the Princess Charlotte in Windsor Chapel, of a sudden the feeling came upon him that before he had witnessed the same spectacle. The illusion was transitory, but we shall see cases in which it it more lasting. Lewes justly classes this phenomenon with others of more frequent occurrence. While journeying in regions never before visited by us, a turn of the road or a bend in the river brings us in sight of some landscape that we have seen before; meeting a person for the first time, we *feel* that we must have seen him elsewhere; on reading in a book a passage that certainly we never read before, we feel that the thoughts have once been in our minds.

This illusion is easily explained. The new impression evokes from the past similar impressions, which, though indistinct, confused, evanescent, still suffice to give to the new state of consciousness the appearance of being a repetition. There is a ground of resemblance quickly perceived between the two states of consciousness which leads us to identify them. It is an error, but only a partial one, for there is in reality in our past something that resembles a prior experience of this present impression. While this explanation may do for very simple cases, there are others to which it will not apply.

A patient, says Sander, on hearing of the death of one he had known, was seized with an indefinable terror, because it seemed to him that he had already had the impression. "It was as though, some time ago, while he was lying on this very bed, X came and told me that Müller was dead. I replied, 'Müller died some time since; he cannot die twice.'"

Dr. Arnold Pick relates the most perfect instance of false memory I know of, the disorder assuming an almost chronic form. An educated man who reasoned clearly about his malady, and who wrote a description of it, was, at about the age of thirty-two, seized with a peculiar mental disorder. If he attended a festival, or visited any place, or fell in with any one, the occurrence, with all its circumstances, seemed to him so familiar, that he firmly believed that he had already had the self-same impressions, in the company of the same persons, under the same skies, the same weather, etc. If he did a piece of work, it seemed to him that he had done the very same work before under the same circumstances. This feeling occurred to him the same day, at the end of a few minutes, or a few hours, sometimes on the next day, but always with perfect distinctness. *

In false memory there is an anomalous condition of the mental mechanism that eludes observation, and which it is difficult to understand in the healthy state. The patient, even though he were a good observer, could only analyze it by ceasing to be under the illusion. Still I think these instances show that the impression received is reproduced in the form of a sensorial image—in physiological terms, there is a repetition of the primary cerebral process. This is nothing extraordinary, it is what occurs in every recollection that is not called forth by the actual presence of its object. The difficulty is to say why this image, appearing a minute, an hour, a day, subsequent to the real state of consciousness, gives to the latter the appearance of being a repetition. We may suppose the mechanism of recollection, of localization in

* "Archiv für Psychiatrie," 1876.

time to be working retrogressively. I venture to offer the following explanation :

The image thus formed, as has been said, is highly intense—*of the nature of an hallucination*. Consequently the real impression is thrown into the background, bearing the less distinct character of a recollection. It is localized in the past, erroneously if you consider the facts objectively, rightly if you consider them subjectively. This hallucinational state, though very vivid, does not, in fact, efface the real impression ; but as it is produced by it and becomes detached from it, it appears like a subsequent experience. It takes the place of the real impression, appears the more recent of the two, and in fact is the more recent. For us who look at the thing from without and in the light of what has taken place outside of the mind of the subject, it is not true that the impression has been received twice ; but from the point of view of the subject himself, who judges according to what consciousness tells him, it is true that the impression has been received twice, and within those limits his asseveration is incontestable.

In support of this explanation I may add that false memory is nearly always associated with mental disorder. The patient spoken of by Pick was subject to one form of insanity—he supposed himself to be the victim of persecution. Hence the formation of hallucinational images is quite natural. Still I do not pretend that my explanation is the only possible one. The case being so very uncommon, further and more careful observation is requisite

CHAPTER V.

CONCLUSION.

Relations between the retention of perceptions and nutrition, between the reproduction of recollections and the general and local circulation—Influence of the quantity and quality of the blood—Examples—The law of regression connected with a physiological principle and a psychological principle—Recapitulation.

I.

So far we have been describing the diseases of memory and seeking the law which governs them. Before we conclude we must say a word as to the causes, of course we mean immediate, organic causes. But even reduced to these terms the etiology of disorders of memory is very obscure, and very little is clearly ascertained with regard to it.

Memory consists in retaining and reproducing: retention seems to depend above all on nutrition; reproduction on the general or the local circulation.

I. Retention, which plays the more important part since without it reproduction is impossible, presupposes a primary condition which can only be vaguely defined as a normal constitution of the brain. As we have seen, idiots suffer from congenital amnesia, from innate inability to fix impressions in the memory. This primary condition is a postulate, not simply a condition of memory, but the necessary condition of the existence of memory.

This normal condition of the brain being granted, it is not enough that impressions be received, they must be fixed, organically registered, incrusted, so to speak: they must become a permanent modification of the brain; the modifications impressed upon the nerve-cells and nerve-filaments, and the dynamic associations between these elements must be made stable. This result can be produced only by nutrition. The brain, and particularly the gray matter, receives an enormous volume of blood. In no other part of the body is the nutritive function so active or so rapid. We know not the inner mechanism of this function. The minutest histological research is unable to trace the arrangements and rearrangements of the molecules. We know only the effects—all beside is but induction. But all sorts of facts go to show the close connection between nutrition and memory.

It is matter of every-day observation that children learn with wonderful facility, and that anything, as languages, which calls only for memory, is readily learned by them. We know, furthermore, that habits—that is to say one form of memory--are far more easily formed in childhood, in youth, than in maturity. At that period of life, so great is the activity of the nutritive process that new connections are rapidly formed. In the aged, on the contrary, a rapid effacement of new impressions coincides with a considerable decline of this activity.

That which is too quickly learned does not endure. When we say that a thing is "assimilated," we use no metaphor. I shall not dwell upon a truth that every one is ever repeating, little suspecting that this psychic fact has an organic cause. To fix recollections requires time, because nutrition does not accomplish its work instantaneously: the molecular movement constituting nutrition must proceed in one constant direction, and this end is served by the periodic renewal of the same impression.*

*"A distinguished theatrical performer," says Abercrombie, "in consequence of the sudden illness of another actor, had occasion to prepare himself, on very short notice, for a part which was entirely new to him ; and the part was long and rather difficult. He acquired it in a very short time, and went through it with perfect accuracy, but immediately after the performance forgot every word of it. Characters which he had acquired in a more deliberate manner he never forgets, but can perform them at any time without a moment's preparation; but in regard to the character now mentioned, there was the further and very singular fact that, though he has repeatedly

Fatigue in every shape is fatal to memory. The impressions received under such conditions are not fixed, and the reproduction of them is very laborious and often impossible. Now, fatigue is regarded as a state wherein, owing to the over activity of an organ, the nutrition suffers and halts. When the normal conditions are restored, memory comes back again. The case already quoted from Sir Henry Holland is decisive upon this point.

We have seen that in cases of temporary amnesia, caused by concussion of the brain, the amnesia is always retroactive, extending back to a period of greater or less duration, anterior to the accident. This rule is almost without exception. Most physiologists who have studied this phenomenon, refer it to defective nutrition; the organic registration, which consists in a nutritive modification of the cerebral matter, has not had time to take place.

Finally it is to be noted that the gravest form of disease of memory, namely the progressive amnesia of the demented, of the aged, and of general paralytics, is produced by a steadily increasing atrophy of the nerve-elements. The tubes and the cells undergo a process of degenerescence, and the latter eventually disappear, leaving behind an undifferentiated mass of matter.

These physiological and psychological facts all show that there exists between nutrition and retention the relation of cause and effect. There is exact coincidence between their periods of rise and fall. Variations short or long in the one are repeated in the other. If the one be active, or moderate, or languishing, so is the other. Hence the retention of recollections must not be regarded metaphysically, and as a "state of the soul" subsisting no one knows where, but as an acquired state of the cerebral organ implying the possibility of states of consciousness whenever their conditions of existence are present.

The extreme rapidity of nutritive changes in the brain, though at first it might appear to cause instability, in fact explains the fixation of recollections. "The waste following activity is restored by nutrition, and a trace or residuum remains embodied in the constitution of the nervous center, becoming more complete and distinct with each succeeding repetition of the impression; an acquired nature is grafted on the original nature of the cell by virtue of its plastic power." *

We here touch the ultimate cause of memory biologically considered; it is an impregnation. It is therefore not surprising that an eminent English surgeon, in treating of the indellible impression made by infectious diseases on living tissues, should have indited the following passage, which seems made to our hand: "It is asked," says Sir James Paget, "how can the brain be the organ of memory when you suppose its substance to be ever changing? or how is it that your assumed nutritive change of all the particles of the brain is not as destructive of all memory and knowledge of sensuous things as the sudden destruction by some great injury is? The answer is, because of the exactness of assimilation accomplished in the formative process; the effect once produced by an impression on the brain, whether in perception or in intellectual act, is fixed and there retained; because the part, be it what it may, which has been thereby changed, is exactly represented in the part which, in the course of nutrition, succeeds to it." * Paradoxical as the connection between an infectious disease and memory may seem, it is nevertheless rigorously exact, from the biological point of view.

II. In a general way the reproduction of recollections seems to depend on the state of the circulation. This point is much more obscure than the preceding, and the data concerning it are very incomplete. One difficulty arises out of the rapidity with which the phenomena succeed one another, and their continual changes. Another difficulty is due to their complexity. For reproduction does not depend on the general circulation alone, but also on the special circulation of the brain, and probably there are in the latter, too, local variations that may exert a strong influence. Nor is that all. We have, further, to take into account the quality no less than the quantity of the blood.

It is impossible to determine, even roughly, the part played by each of these factors in the mechanism of reproduction. We must be content with showing that circulation and reproduction present correlative variations. The main facts going to confirm this view are as follows:

Fever in its several degrees is accompanied by cerebral over-activity, and in this memory largely shares. We have already seen to what a degree of excitation it may attain. We know that in fever the rapidity of the circulation is excessive, that the constitution of the blood is changed, that it is loaded with elements resulting from too accelerated a process of combustion. Here we see a variation in quality and in quantity, which finds expression in hypermnesia.

Even when no fever exists, "impressions of trivial things, in which no particular interest was taken, often survive in memory when

performed it since that time, he has been obliged each time to prepare it anew, and has never acquired in regard to it that facility which is familiar to him in other instances. When questioned respecting the mental process which he employed the first time he performed this part, he says that he lost sight entirely of the audience, and seemed to have nothing before him but the pages of the book from which he had learned it; and that if anything had occurred to interrupt the illusion, he should have stopped instantly." (*Op. cit.*, p. 103.)

* Maudsley, "Physiol. and Pathol. of the Mind".

* "Lecture on Surgical Pathology."

impressions of much more important or imposing things fade away; and in considering the circumstances, it will frequently be found that such impressions were received when the energies were high—when exercise, or pleasure, or both, had greatly raised the action of the heart. That at times, when strong emotion has excited the circulation to an exceptional degree, the clustered sensations yielded by surrounding objects are revivable with great clearness, often throughout life, is a fact noticed by writers of fiction as a trait of human nature."*

Note again how easy and how rapid reproduction is in that period of life when the blood flows swift and strong, but how slow and labored, when age slows the circulation. Also how in the aged the constitution of the blood is changed, being less rich in globules and in albumen.

In persons debilitated by protracted disease, memory grows weak with the circulation. "Highly nervous subjects, in whom the action of the heart is greatly lowered, habitually complain of loss of memory and inability to think—symptoms which diminish as fast as the natural rate of circulation is regained." †

There is exaltation of memory whenever the circulation has been modified by stimulants, as hasheesh, opium, etc., which excite the nervous system first, and then depress it. Other therapeutic agents produce the opposite effect; for instance, bromide of potassium, the action of which is sedative, hypnotic, retards the circulation, when taken in strong doses. A certain preacher had to give up the use of the bromide, having lost nearly all power of memory. It returned when he ceased to take the medicine.

The general conclusion to be drawn from all these facts is that the normal exercise of memory presupposes an active state of the circulation and a constitution of the blood rich in the materials necessary for integration and disintegration. When this activity becomes excessive there is a tendency to morbid excitation; when it decreases, there is a tendency to amnesia. More definite conclusions would have to rest on pure hypothesis. Why is it that one category of recollections rather than another is revived or effaced? We know not. There is in every case of amnesia and of hypermnesia so much that cannot be foreseen that it were vain to attempt an explanation. Probably it is flitting organic modifications, causes infinitesimally small, that make one series of impressions more easy or more difficult of recall than others. Some physiologists are of the opinion that limited and temporary eclipses of memory are due to local, transitory modifications of the caliber of arteries, under the action of the vaso-motor nerves; and have cited as proof of this the fact that the return of memory is sudden, that it is caused by emotion and that the emotions have a special influence upon the vaso-motor system.

In cases of complete loss of memory, of which we have cited many, return depends on the circulation and nutrition. If it is sudden, and it but rarely is, the more probable hypothesis is that of an arrest of function, a state of inhibition which is suddenly terminated: this problem is one of the most intricate in nerve physiology.

If the return is the result of reeducation—and this is more usual—nutrition appears to play the principal part. The rapidity with which the patient learns again shows that all was not lost. The cells may have been atrophied, but if their nuclei (generally regarded as the sources from which they are reproduced) give rise to other cells, then the bases of memory are by that very fact reestablished: the new cells resemble the parent cells in virtue of the tendency of all organisms to maintain their type, and of all acquired modifications to become transmitted modifications; in this case, memory is only a form of heredity.

II.

To sum up, memory is a general function of the nervous system. Its basis is the property possessed by the nerve-elements of retaining a received modification and of forming associations. These associations, the result of experience, we have called dynamic, to distinguish them from those which are natural or anatomical. Retention is assured by nutrition, which is ever making the modifications and associations stable, because it is ever renewing the modified nerve-substance. The power of reproduction seems to depend above all on the circulation.

Retention and reproduction: thus does all that is essential to memory depend on the fundamental conditions of life. The rest—consciousness, exact localization in the past is only a perfectionment. Psychic memory is only the highest and most complex form of memory. To restrict oneself to that, as most psychologists do, is to condemn oneself in advance to wrestle with mere abstractions.

These preliminaries settled, we have classified and described the diseases of memory; and as a precise observation is always of far more value than a general description, being more instructive and more suggestive, we have offered clear and authentic instances of each morbid type.

Having traversed a multitude of facts, we have pointed out their principal results, viz., first the necessity of resolving memory into *memories*, the mutual independence of which is clearly proved by pathological cases. Then we have shown that the destruction of memory proceeds according to a *law*. Setting aside secondary disorders, those of brief

* Herbert Spencer, "Principles of Psychology," I, p. 235.
† *Ib.*, p. 237.

duration and which are less instructive, and studying those whose evolution is normal, we have shown that:

In *general* dissolution of memory, the loss of recollections, follows an invariable order, namely: first, recent events; next, ideas in general; then, feelings; lastly, acts.

In *partial* dissolution of the most usual type, namely, sign-amnesia, the loss of recollection again proceeds according to an invariable order, viz., proper names, common nouns, adjectives and verbs, interjections, gestures.

The order is the same in both, namely, there is a regression from the more recent to the older, from the complex to the simple, from the voluntary to the automatic, from the less to the more organized.

The exactitude of this *law of regression* is proved by the very rare instances in which progressive dissolution of memory is followed by recovery; the recollections in that case come back in the inverse order of their disappearance.

By the aid of this law of regression we have been enabled to explain the extraordinary reviviscence of certain recollections as a reversion of the mind back to states that seemed to have been effaced forever.

We have connected our law with the physiological principle that degenerescence first affects that which is of most recent formation; and with the psychological principle, that the complex disappears before the simple, because it is less often repeated in experience.

Finally, our pathological study has led us to the conclusion that memory consists of an organization process having varying degrees of perfection between these two extreme limits—the new state, the organic registration.

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THE DISEASES
OF
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By TH. RIBOT,

Author of "The Diseases of Memory."

Translated from the French by J. Fitzgerald, A.M.

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CHAPTER I.

Introduction.—The Question Stated.

During the last few years several authors have treated in detail certain departments of psychology according to the principle of evolution, and it has appeared to me that these questions might be discussed with advantage in the same spirit though in a different form, by studying the process of *dissolution*. I propose therefore in the present work to attempt such a study of the Will as I before made of the Memory; to investigate its anomalies, and from this research to draw some conclusions touching the normal state. In many respects the problem that confronts us here is more difficult than the former one: the term *will* denotes something more vague than the term *memory*. Whether we regard memory as a function, a property or a faculty, it is at all events a stable mode of being, a psychic situation that all may understand. The will on the other hand is resolvable into volitions, each one of which is a thing apart, an instable form of activity, a resultant varying according to the causes that produce it.

Besides this first difficulty there is another one that might seem greater still, but this we shall have no hesitation in dismissing summarily. Is it possible to study the pathology of the will without touching upon the irresolvable problem of free will? I hold it to be possible, and even indispensable, to abstain from such discussion; nor is it timidity that imposes this abstention upon us, but simply method. Psychology, like all other experimental sciences, must strictly eschew all research into first causes, and to that class of studies does the problem of free will belong. One of the great services rendered to philosophy by Kant and his disciples consisted in proving that the problem of the freedom of the will resolves itself into the question whether we are able to place ourselves outside the series of effects and causes so as to make an absolute beginning. This power "which summons, suspends, or dismisses," as it has been defined by a contemporary writer who has studied it profoundly,* can be affirmed only on the condition that we enter the domain of metaphysics.

The task before us here is different. Experience both inward and outward is the one object of our research: its limits are our limits. We take volitions as facts, with their immediate causes, that is to

* Renouvier, "Essai de Critique Générale," 2d edition, I., 395-406.

say the motives which produce them, without inquiring whether these causes suppose causes *in infinitum*, or whether there is not some measure of spontaneity added to them. Hence the question presents itself in a form equally acceptable to the determinists and to their opponents, being consistent with either hypothesis. We expect furthermore to pursue our researches in such a manner that the absence of any sort of solution of the free will problem will not even be noticed.

I shall endeavor to show that in every voluntary act there are two distinct elements, namely the state of consciousness—the "I will"—which indicates a mental situation but which of itself possesses no efficiency; and a highly complex psychophysiological mechanism in which alone the power of acting or of inhibiting has its seat. As this general conclusion can only be reached as the result of particular conclusions furnished by pathology, I will for the time being abstain in this introduction from any systematic view of the subject, and will simply consider the will in its twofold mechanism of impulsion and inhibition, and in its source—the individual character—regardless of details that do not concern our subject.*

The fundamental principle governing the psychology of the will in its impulsive form both in the healthy and the morbid state, is that every state of consciousness always tends to express itself, to interpret itself by a movement, by an act. This principle is only a particular phase, special to psychology, of the fundamental law that reflex action is the sole type of all nerve action, of all life of relation. Properly speaking activity in an animal is not a beginning but an end, not a cause but a result, not a first appearance but a sequel. This point is of the highest importance, and it must not be lost sight of. It alone can explain the physiology and the pathology of the will, for this tendency of the state of consciousness to expend itself in a psychological or a physiological act whether conscious or unconscious, is the one simple fact to which are reducible all the combinations and all the complexities of the highest will activity.

The new-born babe, as Virchow defines it, "is but a spinal creature." Its activity is purely reflex, manifested by such a multiplicity of movements that for a good while its education must consist in suppressing or in checking the greater part of them. This prodigality of reflex actions, which has its ground in anatomical relations, exhibits in all its simplicity the transformation of excitations into movements. These movements, whether they are conscious or whether they awaken only an inchoate consciousness, in neither case represent voluntary action: properly they do but express the activity of the species—that which has been acquired, organized, and fixed by heredity: but these are the material out of which the will shall be fashioned.

Desire marks a higher step in the progress from the reflex state to the voluntary. By desire we understand the more elementary forms of the affective life—the only ones that can exist prior to the birth of the intelligence. Physiologically these do not differ from reflex actions of a complex nature: psychologically they differ from the latter by the state of consciousness, often very intense, which accompanies them. Like as in reflex action, they tend directly and irresistibly to express themselves in acts. In the natural state, and so long as it is free from admixture, desire tends to satisfy itself immediately: such is its law imprinted in the organism. Children and savages are good instances. In the civilized adult desire is no longer in the natural state, being altered or curbed by education, habit or reflection. Often however it resumes its right; and history shows that in the case of despots, who in their own esteem and in that of others stand above all law, desire rules uncontrolled.

Pathology will show us that this form of activity grows as will power declines, and persists when the latter has disappeared. Nevertheless it marks a progress from the first period, inasmuch as it denotes a beginning of individuality. On the common ground of the activity which belongs to the species, desire limns in faint outline the individual character: it reflects the mode of reaction peculiar to an individual organism.

When a sufficient store of experiences exists to allow of the birth of the intelligence, there appears a new form of activity,—*ideomotor* activity it has been called, ideas, thoughts, being here the cause of movements. The term *ideomotor* has the further advantage that it points out the relationship between these movements and those of reflex action, of which the former are but a development.

* The reader will find in a recent work by Schneider, "Der Menschliche Wille vom Standpunkte der neueren Entwickelungstheorien" (Berlin, 1882), a good monograph on the will in its normal state, and from the point of view of evolution.

How can a thought produce a movement? This question is one that seriously embarrassed the old psychology, but it presents no difficulty when we look at the facts as they really are. It is now a truth currently accepted in cerebral physiology, that the anatomical basis of all our mental states comprises both motor and sensorial elements. I shall not dwell upon a question that has been treated fully in another place * and which would involve a digression. I would simply repeat that our sense perceptions, especially the important ones of sight and touch, involve as integral elements movements of the eye or of the members. And if movement is an essential element when we see an object actually, it must play the same part when we see an object ideally. Mental images and ideas, even abstract ideas, involve an anatomical substratum in which movements are represented in one way or another.

True, on studying the question more closely, it might be said that we must distinguish two kinds of motor elements, viz.: those which serve to constitute a state of consciousness, and those which serve to expend it—the former being intrinsic, the latter extrinsic. The idea of a ball, for instance, is the resultant of impressions made by surfaces, and of special muscular adjustments; but the latter are the result of muscular sensibility, and as such they are sensations of movement rather than movements proper—they are elements going to make up our idea of the object, rather than a mode of giving it expression.

Nevertheless this close relation established by physiology between ideas and movement enables us in some measure to see how the one produces the other. In reality, an idea does not produce a movement. Were an idea, as defined by the spiritualists,† to produce a play of the muscles, it were little short of a miracle. It is not the state of consciousness, as such, but the corresponding physiological state, which is transformed into an act. In short the relation is not between a psychic event and a movement, but between two states of the same kind—between two physiological states, two groups of nervous elements, the one sensitive, the other motor. So long as we persist in regarding consciousness as a cause, all is obscure; but when we look upon it as simply the accompaniment of a nervous process, which alone is the essential element, all becomes clear, and factitious difficulties vanish.

This granted, we can roughly classify ideas in three groups, according as their tendency to transform themselves into acts is strong, moderate or weak and in a certain sense null.

1. The first group comprises intellectual states of high intensity: fixed ideas may be regarded as the type of these. They pass into act almost with the rapidity of reflex actions. These are ideas that "come home to us." The old psychology, affirming a fact of every day experience, used to say in its own language that the intelligence does not act upon the will save through the intermediation of the sensibility. This means that the nervous state corresponding to an idea is more readily translated into a movement, in proportion as it is accompanied by those other nervous states, whatever they may be, which correspond to feeling or sentiment. Nervous action is more energetic in proportion to the number of elements upon which it acts.

Most of the passions when they rise above the level of mere appetite, are to be referred to this group as principles of action. The whole difference is one of degree only, according as the affective elements predominate, or *vice versa*, in the complex thus formed.*

2. The second group is the most important for us. It represents rational activity—the will in the common acceptation of the word. Here the thought is followed by the act after longer or shorter deliberation. If we reflect we shall find that most of our actions are reducible to this type, allowance being made for the forms already mentioned, and for habits. Whether I rise to take the air at my window, or whether I enlist in the army with the purpose of becoming some day a general, the difference is only one of more and less; a highly complex volition like that last instance, resolving itself into a series of simple volitions successively adapted to times and places. In this

* "Revue Philosophique," Oct., 1879.

† As opposed to "Materialists." It need hardly be said that the author has not in mind "Spiritists," or "Spirit Rappers."—TRANSLATOR.

* The relative independence of thought and feeling as causes of movement is clearly demonstrated by certain pathological cases. It may happen that the idea of a movement is of itself incapable of producing that movement: but let emotion be added and it is produced. A man that is paralyzed cannot by any effort of will move, say, his arm, yet it will be strongly agitated under the influence of an emotion caused by the arrival of a friend. In the case of softening of the spinal cord inducing paralysis an emotion, or a question addressed to the patient may give rise to more violent movements in the inferior members, upon which the will has no action.

group the tendency to act is neither instantaneous nor violent. The concomitant affective state is moderate. Many of the actions which constitute the ordinary course of our lives were at first accompanied by a feeling of pleasure, or curiosity and the like: now that feeling is weakened, still the connection between the idea and the act is fixed: when the idea comes up in the mind, the act follows.

3. With abstract ideas the tendency to movement is at a minimum. These ideas being representations of representations, pure schematisms, generalized concepts, the motor element is minimized in the same degree as the representative element. If we were to look upon all the forms of activity we have been considering as successive complications of simple reflex action, we might say that abstract ideas are a collateral ramification weakly attached to the main trunk, and which has developed in its own way. Their motor tendency is restricted to that inner speech, feeble as it is, which accompanies them, and to the awakening of some other state of consciousness. For just as in physiology the centrifugal period of a reflex action does not always end in a movement, but quite as often in the secretion of a gland or in some trophic action; so in psychology a state of consciousness does not always end in a movement, but in the summoning up of other states of consciousness, according to the well known mechanism of association.

The contrast so often noted between contemplative minds, who live among abstractions, and practical men is only the outward palpable expression of the psychological differences just mentioned. A few commonplace observations may be cited here, as the difference between knowing what is right and practicing it, between recognizing the absurdity of a creed and renouncing it, between condemning an unlawful passion and withstanding the same. All this is explained by the fact that the motor tendency of ideas, left to themselves, is exceedingly weak. We know not what are the anatomical and physiological conditions requisite for the production of an abstract idea, but we may without rashness affirm that once it becomes a motive to action other elements are added to it: this is the case with those who are "devoted to an idea." Men are governed by feeling and sentiment.

In the light of the foregoing remarks voluntary activity appears to us as a stage in that progressive evolution which proceeds from simple reflex action, where the tendency to movement is irresistible, to the abstract idea, where the tendency to action is at the minimum. We are unable to determine precisely its beginning or its end, the transition from one form to another being almost imperceptible. Of set purpose and for the sake of clearness we have not examined the problem in its complexity: we have even eliminated one of the essential characteristic elements of will. Regarded as we have regarded it so far, will might be defined as a conscious act, more or less deliberate, having in view an end whether simple or complex, proximate or remote. It is thus that contemporary authors, as Maudsley and Lewes, understand it, when they define it to be *impulse by ideas*, or the *motor reaction of feelings and ideas*. Thus understood, volition would be simply permissive. But it is something very different. It is also a power of *arrestation*, or, to use the language of physiology, a power of *inhibition*.

For a psychology grounded only on inner observation this distinction between permitting and hindering is of little importance; but for a psychology that seeks to find in the physiological mechanism some explication of the operations of mind, and which regards reflex action as the type of all activity, it is of vital significance.

The currently received doctrine teaches that the will is a *fiat* which the muscles obey no one knows how. On this hypothesis it matters little whether the *fiat* commands a movement or an inhibition. But if with all contemporary physiologists we hold that reflex action is the type and the basis of all action whatever, and if consequently there is no occasion to ask why a state of consciousness is transformed into a movement—for that is the law—we have still to explain why it is not transformed. Unfortunately physiology is full of obscurity and indecision touching this point.

The simplest instance of the phenomenon of inhibition is seen in the suspension of the movements of the heart by excitation of the pneumogastric nerve. We know that the heart (independently of the intracardiac ganglia) is innervated by nerve filaments coming from the great sympathetic which accelerate its pulsations, and by filaments from the vagus nerve. Section of the latter increases the movements; excitation of its central terminus on the contrary suspends them for

a longer or shorter time. The vagus therefore is an inhibiting nerve, and inhibition is generally regarded as the result of interference. The reflex activity of the cardiac centers is retarded or suspended by excitations coming from the medulla. In other words, the motor action of the pneumogastric expends itself in the cardiac centers and produces an arrest of movement. This has no direct psychological significance, but here is something that concerns us more nearly:

It is a well known fact that the reflex excitability of the spinal cord becomes greater when it is withdrawn from the action of the brain. The state of decapitated animals gives striking evidence of this. But not to recur to those extreme cases, we know that reflex action is much more intense during sleep than in the waking state. To account for this some authors have held that there are in the brain centers of inhibition. Setschenow locates them in the optic thalami and in the region of the tubercula quadrigemina, his ground being the fact that when we stimulate by chemical or other means the parts named, we produce a depression of the reflex actions. Goltz locates the centers of inhibition in the brain proper.

These and other similar hypotheses * have been sharply criticized, and many physiologists hold simply that in the normal state excitations are distributed both to the brain taking an upward route and to the spinal cord by a transverse route; and that on the other hand in cases where the brain cannot play a part, the excitations now finding only one route open, the result is a sort of accumulation, the effect of which is an excessive reflex excitability. Ferrier † holds that in the frontal lobes are to be found controlling centers which are the essential factor of attention.

Not to go into further detail, it is seen that for explaining the mechanism of inhibition we have no clear and generally accepted theory such as we have with regard to reflex action. Some authors hold that inhibition results from two contrary tendencies clashing or destroying each other; others maintain the existence of inhibition centers (and even inhibiting nerves) capable of suppressing instead of re-enforcing a transmitted impulse; and there are sundry other hypotheses, but it would be of no advantage to enumerate them.* In this state of ignorance, we must examine the question as best we may.

In all voluntary inhibition two things have to be considered: the mechanism that produces it—of this we have just spoken; and the state of consciousness that accompanies it: of this we have to speak now. In the first place there are cases where the inhibition needs no explanation—where the will incitation ceases of its own accord: for instance, when one throws aside a decidedly tedious book.

Other cases appear to be explained by one or other of the hypotheses mentioned. We voluntarily arrest laughter, yawning, coughing and certain passionate movements, by putting in action, apparently, the antagonistic muscles.

In cases where as yet we know not how inhibition is produced, where the physiological mechanism is unknown, pure psychology may teach us something. Take the most commonplace instance—a fit of anger stayed by the will. Lest we exaggerate the power of the will, we would remark that such inhibition is far from being the rule. Some individuals appear to be utterly incapable of it. Others exercise it, but very unequally, their power of inhibition varying according to times and circumstances. Few men are at all times masters of themselves.

The first condition of the exercise of this power is time. If the incitation to anger be so violent as to pass immediately into action, that is the end of it. Whatever may be the excess of passion there is no help for it. But if the condition of time be filled; if the state of consciousness calls up antagonistic states, and if these are sufficiently stable, then there is inhibition. The new state of consciousness tends to suppress the other one, and by weakening the cause puts a check on the effects.

It is of supreme importance for the pathology of the will to investigate the physiological phenomenon that takes place in such cases. There is no doubt that the quantity of the nervous influx—whatever our opinion may be as to its nature—varies between individuals, and from one moment to another in the same person. Neither is there any doubt that, at a given moment, in any individual, the available quantity may be variably distributed. It

* For a full history of this question the reader may consult Eckhard, "Physiologie des Rückenmarks" in Hermann's "Physiologie," vol. ii., part 2, p. 33 *seq.* He will there find an account of the experiments of Setschenow, Goltz, Schiff, Herzen, Cyon, and others, with their interpretations.

† "The Functions of the Brain," §§ 103, 104.

* See Wundt's "Mechanik der Nerven;" Lewes's "Physical Basis of Mind"

is clear that in the case of the mathematician making a computation and in that of a man gratifying a physical passion the quantity of nervous influx is not expended in the same way, and that one form of expenditure prevents the other, as the available capital cannot be employed at once for two purposes.

"We see," says a physiologist, "that the excitability of certain nerve centers is reduced by calling other nerve centers into action, if the excitations that reach the latter possess a certain intensity. If we consider the normal functionment of the nervous system, we find that there exists a necessary equilibrium between the different apparatus of this system. This equilibrium may be destroyed by the abnormal predominance of certain centers, which seem to divert to their own advantage too large a proportion of the nervous activity; as a consequence, the functionment of the other centers appears to be disturbed. . . . There are certain general laws that govern the distribution of the nervous activity at the different points in the system, as there are mechanical laws which govern the circulation of the blood in the vascular system: if any great perturbation occurs in an important vascular department the effect is necessarily felt at all other points in the system. These laws of hydrodynamics we can appreciate because the fluid in circulation is accessible to us, and because we know the properties of the vessels that contain it, the effects of elasticity, of muscular contraction, etc. But who knows the laws of the distribution of nervous activity, of the circulation of what has been called the nerve fluid? We recognize the effects of breaks in the equilibrium of nerve activity, but these are disturbances essentially variable, nor can they be reduced under any theory. We can only note their production, taking account of the conditions that accompany them."*

Applying these general considerations to our particular case, what do we find? The original state of consciousness (anger) has called forth antagonistic states which necessarily vary in different individuals—the idea of duty, the fear of God, the opinion of men, the law, disastrous consequences, etc. The result is the production of a second center of action, or in physiological language, a diversion of the nervous afflux, a weakening of the first state to the advantage of the second. Is this diversion sufficient to restore the equilibrium? The event alone can decide.

Still when the inhibition takes place, it is always only relative, and its only result is that the action is weaker. What remains of the original impulse expends itself as best it can through half-restrained gestures, in perturbation of the viscera, through some artificial outlet, as for instance in the case of the soldier who when he was being shot to death, chewed a bullet so that he might not make any exclamation. Very few persons are so endowed by nature or so formed by habit as to be able to reduce their reflex actions to imperceptible movements.

This diversion of the nervous influx therefore is not a primordial fact, but a state of secondary formation, set up by means of an association at the expense of the state which it displaces.

We would observe that in addition to these two antagonistic centers of action there are other causes which tend to weaken directly the primitive impulse.

But we must examine the difficulty more closely, for though the coexistence of their two antagonistic states* suffices to produce indecision, incertitude, non-action, it is not sufficient to produce voluntary inhibition in the true sense of the phrase, "I will not." One condition more is needed, and this is found in an affective element of the highest importance, of which we have not yet spoken. The feelings and emotions are not all stimulants to action: many of them have a *depressive* effect. Of these terror may be regarded as the extreme type. In its highest degree, terror paralyzes. A man suddenly visited with a great affliction is incapable of any reaction, whether voluntary or reflex. The cerebral anæmia, the arrest of the heart's action—often producing death by syncope—the profuse perspiration with chilling of the skin, the relaxation of the sphincter muscles: all these prove the excitability of the muscular, vaso-motor, secretory and other centers to be for the time being suspended. The case is an extreme one, but it gives us a view of the subject as through a magnifying glass. Between terror and indifference we have all possible degrees of fear with the corresponding degrees of depression.

If from this maximum we descend to moderate fear, the depressive effect grows less, but without changing its character. How do we arrest the movements of anger in a child? By threats, by reprimands, that is to say by producing a new state of consciousness of a depressing kind, capable of checking action. "An infant of three and a half months," says B. Perez,

* Franck, "Dictionnaire Encyclopédique des Sciences Médicales," art. NERVEUX.

* Of course we do not separate them from their physiological conditions, which are the principal element.

" knows from one's looks, from the tone of one's voice, when he is reprimanded. He frowns, his lips quiver convulsively, he pouts for an instant, his eyes fill with tears, and he is ready to cry." The new state therefore tends to supplant the old not only by its own force, but also by the weakness it imposes on the whole physical structure.

If, in spite of repeated menaces there is no inhibition, the individual is hardly, if at all, capable of education in this respect. But if inhibition is produced the result is that, in virtue of a well known law, an association tends to be formed between the two states: the first calls forth the second —its corrective—and from habit inhibition becomes more and more easy and rapid. With those who are masters of themselves inhibition takes place with the certainty that always marks a fully developed habit. Of course temperament and character are of more importance than education.

Hence it is not matter of surprise that a storm of passion should give way before a passionless idea, before states of consciousness whose motor tendency is quite weak. The reason is that back of these lies an accumulated force, latent and unconscious, as we shall see.

To understand this paradox, we must study, not the educated adult person, who reflects, but the child. In the child—and the savage, the man of gross nature and incapable of education is comparable to a child—the tendency to act is immediate. The work of education consists precisely in awakening these antagonistic states. And by education we understand not only the training the child gets from others, but also that which he acquires by himself.

I do not consider it necessary to prove that all sentiments and feelings which produce inhibition, as fear or respect for persons, law, usage, fear of God, and the like, originally were and ever are depressive states which tend to diminish action.

In short, the phenomenon of inhibition may be accounted for, in a way sufficient for our purpose, by an analysis of the psychological conditions under which it occurs, whatever theory one may entertain as to its physiological mechanism. It were no doubt desirable to have clearer notions on this point, to have a fuller understanding of the *modus operandi* whereby two almost simultaneous excitations neutralize each other. Were this obscure question cleared up our conception of the will as a power of inhibition would be more precise, and perhaps it would be different. But we must needs wait for this consummation. We shall again meet this difficult problem under other forms.

So far we have been considering voluntary activity under an exclusively analytical form, but this can give us no exact idea of it, nor exhibit it in its totality. It is neither a simple transformation of states of consciousness into movement, nor a mere power of inhibition: it is a reaction proper to the individual. We must dwell upon this point, for without it the pathology of the will is unintelligible.

The primary character of voluntary movements consists in their being *adapted*, but this character they have in common with the vast majority of physiological movements: the difference is only one of degree.

Apart from movements of the pathological order (convulsions, chorea, epilepsy, etc.), which occur in the form of a violent and irregular discharge, adaptation is found from the top to the bottom of the scale.

Ordinary reflex actions are reactions of the spinal cord adapted to conditions that are very general and therefore very simple; and they are uniform and invariable between one individual and another, save in exceptional cases. They possess a *specific* character.* Another group of reflex actions represents the reactions of the base and of the middle portion of the encephalon—the medulla, the corpora striata, the optic thalami. These reactions too are adapted to general conditions that vary little, but which are much more complex: they exhibit the "sensorimotor" activity of some authors. Even these are specific rather than individual, being very much the same in all the individuals of the same species.

The reflex actions of the brain, especially those of the highest type, consist of a reaction adapted to conditions highly complex, variable and instable, and differing between one individual and another, and from one moment to another in the same individual. These are the ideomotor reactions—volitions. How perfect soever this adaptation may be, it does not concern us here. It is only an effect, the cause of which is, not volition, but intellectual activity. The intelligence being a correspondence, a continual adjustment of internal relations to external, and in its highest form a perfectly coördinated ad-

* That is, they belong to the *species*.—TRANSLATOR.

justment, the coördination of these states of consciousness implies coördination of the movements that express them. So soon as an end is chosen, it acts after the manner of what is called by metaphysicians a final cause: it involves the choice of the means proper for its attainment. The adaptation therefore is a result of the mechanism of the intelligence. This point need not detain us.

But what interests us is this *choice*, this preference declared after a longer or shorter comparison of the motives. This it is which represents the individual reaction, as distinguished from the specific reactions: in the pathology of the will the former is sometimes superior, sometimes inferior to the latter.

What is this choice? Considered in its form, it is nothing but a *practical* affirmation, a judgment that executes itself. It is to be noted that considered physiologically and from without there is nothing to distinguish a voluntary from an involuntary movement: the mechanism is the same whether I wink my eyes reflexly or as a signal to an accomplice.* Considered psychologically and from within, there is nothing to distinguish a judgment in the logical sense of that term, *i.e.*, a theoretic affirmation, from a volition, save that the latter expresses itself by an act and thus is a judgment put in execution.

But what is it considered in its essence and not merely in its form? We will dwell for a moment on this point and will endeavor to throw some light upon it. By descending to a few very lowly biological facts we shall perhaps better understand wherein a choice consists. I shall not wander afield in search of analogies—for instance, the affinity of the magnet for iron. In the vegetable kingdom I shall simply quote the fact that insectivorous plants, as Dionæa, choose certain bodies that come in contact with them, to the exclusion of other bodies. So too the Amœba chooses certain organic fragments for its nourishment. These facts are incontestable, but they are difficult of interpretation. They are explained in a general way on the theory of a relation between the molecular composition of the organism choosing and the organic substance chosen. No doubt the choice is exercised here in a very narrow field; no doubt, too, this is the rudest form of choice. With the rise and development of a more and more complex nervous system this blind affinity is transformed into a conscious tendency, and then into several contradictory tendencies whereof one gains the mastery—the one which represents the maximum of affinity. Example: a dog hesitating between several pieces of meat and choosing one. But in every case the choice expresses the nature of the individual at a given moment, under given circumstances, in a given degree: that is to say, the weaker the affinity the less marked the preference. Hence we may affirm that the choice, whether it results from one tendency or from many tendencies, from a present sensation, from images recalled, from complex ideas, or from complicated calculations projected into the future, is always based on an affinity, an analogy of nature, an adaptation. This is true of animals whether the lower or the higher, and of man, with respect either to vice or to virtue, science, pleasure or ambition. To restrict our remarks to man, two or more states of consciousness arise as possible ends of action; after some oscillations one end is preferred, chosen. Why so, unless it is that between this state and the sum of states conscious, subconscious and unconscious (the latter purely physiological) which at this moment constitute the person, the Ego, there exists agreement, analogy of nature, affinity? This is the only possible explanation of the choice, unless we say it is without a cause. Some one suggests that I kill my friend: that tendency is rejected with horror, excluded; that is to say it is in contradiction to my other tendencies and feelings, there is no association possible between it and them, and by that very fact it is suppressed.

In the mind of the criminal on the contrary there appears to be a certain agreement, that is an analogy, between the murder and his feelings of hate or avarice, and consequently it is chosen, affirmed as something that ought to be. Hence considered as a state of consciousness, volition is nothing but an affirmation (or a negation). It resembles a judgment, with this difference, that the one expresses a relation of agreement (or disagreement) between ideas, while the other expresses the same relation between tendencies; that while the one is a repose for the mind, the other is a stage of progress

* Physiologists distinguish between voluntary and involuntary muscles, but admit that the distinction is in no wise absolute. There are persons, like E. F. Weber, the physiologist, who can at will stay the movements of the heart; others, like Fontana, who can produce contraction of the iris, and so on. A movement is voluntary when, after repeated successful experiments, it becomes associated with a state of consciousness and falls under its control.

toward action; while the one is an acquisition, the other is an alienation, for intelligence is a saving and will an expenditure. But volition in itself, as a state of consciousness, has no more power of producing an act than the judgment has of producing a truth. That power comes from another source. We will return, toward the conclusion, to this important point.*

The ultimate reason of choice is therefore in the character, that is to say in that which constitutes the distinctive mark of the individual in the psychological sense, and differentiates him from all other individuals of the same species.

Is the character, or, to use a more general term, the person, the Ego, which for us is a cause—is it in its turn an effect? Undoubtedly it is, but we are not concerned here with the causes which produce it. The science of character, which 40 years ago John Stuart Mill regarded as a desideratum, does not yet exist, nor will it ever, in my opinion. Were there such a science we should have only to accept its results, without essaying an excursion into its domain, for to be ever tracing effects to their causes would be to follow the devious steps of metaphysics. As regards the matter in hand, we repeat, character is an ultimate fact, a true cause, though for another order of research it is an effect. We would remark in passing, and as a simple suggestion, that character —the Ego so far as it reacts—is an exceedingly complex product to the formation of which heredity and physiological circumstances both anterior and posterior to birth, as education and experience, have contributed. We may also affirm that what constitutes character is affective states, and the individual's own feelings, much more than any intellectual activity. It is the general tone of the individual's feelings, the general tone of his organism that is the first and the true motor. If this is lacking, the individual cannot exercise will at all, as we shall learn from pathology. It is precisely because this fundamental state is, according to the individual constitution, stable or fluctuating, continuous or variable, strong or weak, that we have three principal types of will —strong, weak and intermittent—with all intermediate degrees and shades of difference between the three. But these differences, we repeat, spring from the character of the individual, and that depends upon his special constitution. We cannot push the inquiry beyond that point.

We are thus fully in agreement with those who say that the predominance of a motive by itself does not explain volition. The preponderant motive is only a part of the cause, and always the weakest part too, though the most visible: nor has it any efficaciousness except inasmuch as it is chosen, that is, as it forms an integral part in the sum of the states constituting the Ego at a given moment, and as its tendency to action is added to the group of tendencies that spring from the character, forming one with them.

Hence it is not necessary to look on the Ego as an entity nor to place it in some transcendental region, in order to recognize in it a causality of its own. It is a very plain fact of experience; the contrary is incomprehensible.

Physiologically all this means that the voluntary act differs both from simple reflex action, where one impression is followed by one contraction, and from the more complex forms of reflex action where one impression is followed by a number of contractions; that it is the result of the entire nervous organization, which itself reflects the nature of the whole organism, and which reacts in consequence.

Psychologically it means that the voluntary act in its complete form is not merely the transformation of a state of consciousness into movement, but that it presupposes the participation of that whole group of conscious or subconscious states which make up the Ego at a given moment.

We are therefore justified in defining the will to be an individual reaction, and in regarding it as that which is inmost to us. The Ego, albeit an effect, is a cause, and that in the strictest sense.

To sum up, we have seen that from the lowest reflex action to the highest act of will the transition is imperceptible, and that we cannot say precisely where volition proper, that is the personal reaction, begins. The difference is most pronounced at the two ends of the series: at one end extreme simplicity, at the other extreme

* What has been said amounts simply to a statement of the evident fact that a choice proceeds always in the direction of the greatest pleasure. No animal, whether void of reason or gifted with it, whether sound or diseased can will anything save what *seems* to it at the moment to be its greater good or its less evil. Even the man who elects death rather than disgrace or apostasy, chooses the less disagreeable alternative. Individual character and development of the reason cause the choice now to rise very high, again to fall very low; yet always it tends toward that which promises more pleasure. The contrary is impossible. This is a psychological truth so clear that the ancients held it to be an axiom, and it has taken volumes of metaphysics to obscure it.

complexity; on one hand a reaction that is ever the same in all the individuals of the same species, on the other a reaction which varies according to the individual. Simplicity and permanence, complexity and change are here paired.

From the evolution standpoint all these reactions clearly were in their origin individual. They have become specific, from having been repeated times beyond number in the individual and in the race. The beginning of will is found in the property of reacting possessed by all living matter, and its extinction in the property possessed by living matter of acquiring habits; and it is this involuntary activity, fixed and unalterable, which serves as the groundwork and the instrument of the individual activity.

But among the higher animals the hereditary legacy, the chance circumstances of birth, the continual adaptation to conditions that vary every instant, do not permit the individual reaction to become fixed nor to assume the same form in all the individuals. The complexity of their environment is their safeguard against automatism.

Here we bring to an end these preliminary remarks, the only purpose of which was to prepare the ground for the pathology of the will, which we are now to consider.

CHAPTER II.

IMPAIRMENT OF THE WILL.—LACK OF IMPULSION.

As we have seen, the term will denotes acts differing widely with respect to the conditions of their genesis, but all possessing this character in common, that they represent in one form or another, in one degree or another, a reaction of the individual. Without reverting to that analysis we would for clearness' sake note two external characters which distinguish all true volition: it is a definitive state; and it is expressed by act.

Irresolution, which is the beginning of a morbid state, has inner causes which pathology will enable us to grasp; it springs from the weakness of the incitements, or from their ephemeral action. Of persons of irresolute character some—though these are very few indeed—are such from affluence of ideas. The work of comparing motives, of balancing arguments, of calculating consequences constitutes an exceedingly complex cerebral state, wherein the tendencies to action interfere with one another. But affluence of ideas is not of itself a sufficient cause of irresolution; it is only an adjuvant. The true cause here as everywhere is in the character.

This is seen more clearly in persons of irresolute will who have few ideas. They always act in the direction of least action or of weakest resistance. Their deliberation results with difficulty in making up their minds, and after they have made a choice the next step, action, is more difficult still.

Volition on the contrary is a definitive state; it closes the debate. By it a new state of consciousness—the motive chosen—is imported into the Ego as an integral part of it, to the exclusion of other states. The Ego is thus constituted fixedly. In fickle natures this definitive action is always provisional, that is, the Ego willing is so instable a compound that the most insignificant state of consciousness that happens to arise modifies it, alters it. The compound formed at this moment has no force of resistance the moment following. In all the states conscious and unconscious that each moment represent the causes of volition, the part played by the individual character is a minimum, the part played by external circumstances a maximum. Here we have that lower form of will mentioned before which is simply permissive.

We must not forget that to will is to act and that volition is a passing to action. To reduce the will as some do to a simple resolution, that is, to the theoretic affirmation that such or such an act will be done, is to base it upon an abstraction. Making the choice is but one step in the will process. If it does not translate itself into act, whether immediately or at the fit time, then it is in no wise distinguishable from a logical operation of the mind.

The diseases of the will we divide into two principal classes, accordingly as they indicate that the will is *impaired*, or that it is *abolished*.

Impairment of the will constitutes the most important part of its pathology; it exhibits the will mechanism deranged. We shall consider cases of impairment of the will under two heads, viz.: 1. Impairment of the will from lack of impulse; 2. Impairment of the will from excess of impulse. We will consider separately, 3, impairment of voluntary attention, on account of its great importance. And 4, under the head of "Caprices," we will study a special state, wherein will either is not constituted at all, or only by accident.

The first group comprises certain simple and well defined phenomena that may be studied with profit. We find in the normal state many of the elements of this group in those soft and pliant characters who in order to act require that another will should be joined to theirs; but disease will exhibit to us this state enormously exaggerated. Guislain has described in general terms that impairment which physicians designate by the term *aboulia*: "The patients," he says, "can will to themselves, mentally, according to the dictates of reason. They may feel a desire to act, but they are powerless to make a move toward that end. . . . Their will cannot overpass certain bounds: one might say that this force of action undergoes an arrest. The *I will* is not transformed into impulsive will, into active determination. Some patients are themselves surprised at the impotence with which their will is stricken. . . . Left to themselves, they will pass whole days in bed, or sitting in a chair. When spoken to or aroused, they speak rationally though curtly; they judge of things fairly enough."*

As those patients are the most interesting whose intelligence is intact, we shall cite such cases only. One of the earliest observations, and the best known of all, we owe to Esquirol. "A magistrate," he writes, "highly distinguished for his learning and his power as a speaker, was seized with an attack of monomania, in consequence of certain troubles of mind. He regained entirely his reason, but he would not go into the world again, though he acknowledged himself to be in the wrong in not doing so; neither would he attend to his business though he well knew that it suffered in consequence of this whim. His conversation was both rational and sprightly. When advised to travel or to attend to his affairs, 'I know,' he would answer, 'that I ought to do so, but I am unable. Your advice is very good; I wish I could follow it; I am convinced; but only enable me to will, with the will that determines and executes. . . . It is certain,' said he one day to me, 'that I have no will save not to will, for I have my reason unimpaired, and I know what I ought to do, but strength fails me when I ought to act.'" †

Prof. J. H. Bennett records the case of "a gentleman who frequently could not carry out what he *wished* to perform. Often on endeavoring to undress he was two hours before he could get off his coat, all his mental faculties, volition excepted, being perfect. On one occasion having ordered a glass of water, it was presented to him on a tray, but he could not take it, though anxious to do so; and he kept the servant standing before him half an hour, when the obstruction was overcome." He described his feelings to be "as if another person had taken possession of his will." *

Thomas De Quincey describes this paralysis of the will from personal observation. His remarks are the more valuable as coming from a man of subtile mind and fine literary tact. From the effects of long continued abuse of opium he was compelled to give up the studies in which he had been wont to delight. "I shrunk from them," he writes, "with a sense of powerlessness and infantine feebleness the greater from remembering the time when I grappled with them [mathematics, intellectual philosophy, etc.] to my own hourly delight; and for this further reason, because I had devoted the labor of my whole life to constructing one single work. . . . This was now likely to stand a memorial of hopes defeated, of baffled efforts, of materials uselessly accumulated. . . . In this state of imbecility I had for amusement turned my attention to political economy." He speaks of "the utter feebleness of the main herd of modern economists" with whose writings he had been familiar. At length he read Mr. Ricardo's book, and before he had finished the first chapter, wonder and curiosity that had long been dead in him were re-awakened. Conceiving however that some important truths had escaped even Ricardo's eye, he drew up his "Prolegomena to all Future Systems of Political Economy." Arrangements were made for printing this work, and it was even twice advertised. But the author had a preface to write and a dedication to Ricardo, and he found himself quite unable to accomplish all that. So the arrangements were countermanded and the "prolegomena" was not published. "I have thus described and illustrated my intellectual torpor in terms that apply more or less to every part of the four years during which I was under the Circean spells of opium. But for misery and suffering, I might in-

* Guislain, "Leçons Orales sur les Phrénopathies," vol. i., p. 479. See also Griesinger, "Traité des Maladies Mentales" (French translation), p. 46; Leubuscher, "Zeitschrift für Psychiatrie," 1847.

† Esquirol, I., 420.

* Quoted by Carpenter, "Mental Physiology," p. 385, from Bennett, "The Mesmeric Mania of 1851."

deed be said to have existed in a dormant state. I seldom could prevail on myself to write a letter; an answer of a few words to any that I received was the utmost that I could accomplish; and often that not until the letter had lain weeks or even months on my writing table. Without the aid of M. all records of bills paid or to be paid must have perished, and my whole domestic economy, whatever became of Political Economy, must have gone into irretrievable confusion. I shall not afterward allude to this part of the case; it is one however which the opium eater will find in the end as oppressive and tormenting as any other, from the sense of incapacity and feebleness, from the direct embarrassments incident to the neglect or procrastination of each day's appropriate duties, and from the remorse which must often exasperate the stings of these evils to a reflective and conscientious mind. The opium eater loses none of his moral sensibilities or aspirations; he wishes and longs as earnestly as ever to realize what he believes possible and feels to be exacted by duty; but his intellectual apprehension of what is possible infinitely outruns its power not of execution only but even the power to attempt. He lies under the weight of incubus and nightmare; he lies in sight of all that he would fain perform, just as a man forcibly confined to his bed by the mortal languor of a relaxing disease, who is compelled to witness injury or outrage offered to some object of his tenderest love: he curses the spells which chain him down from motion; he would lay down his life if he might but get up and walk; but he is powerless as an infant and cannot even attempt to rise." *

I shall cite only one observation more. It is recorded by Billod in the "Annales Médico-pathologiques," and exhibits the disease in all its aspects. The patient was a man 65 years of age, "of strong constitution, of lymphatic temperament, with a faculty specially developed for business, and of middling sensibility." Being strongly attached to his profession (he was a notary) he hesitated long before he decided to sell his office. Having done so, he fell into a state of profound melancholy, refusing all food, deeming himself undone, and going so far in his desperation as to attempt suicide. In the narrative which follows I omit only a few details of purely medical interest, and permit the observer to describe the case in his own words:

"The faculty that seemed to us to be most notably affected was the will. The patient oftentimes manifests an inability for willing to perform certain acts although he has the wish, and although his sound judgment, after prudent deliberation, convinces him of the fitness and often even the necessity of so acting." The patient was at this time confined in the asylum at Ivry, and it was desired that he should go to Italy with Dr. Billod.

"When told that he must soon leave, 'I never can,' said he, 'yet I am tired of this place.' On the eve of his departure he again protested that he never could leave. The next morning he rose at six o'clock to go and make the same declaration to Mr. M. Some resistance therefore was anticipated, yet when I presented myself he made no opposition whatever, saying only, as though he felt that his will was ready to lapse, 'Where is the coach, so I may lose no time in getting into it.'

"It would be tiresome were we to take the reader with us and exhibit to him all the phenomena presented by the patient during this tour. These phenomena may conveniently be represented by three or four of the principal ones which I shall offer as a sample of all the rest. The first presented itself at Marseilles. The patient was requested, before he took ship, to execute a paper authorizing his wife to sell a house. He drew up the document himself, made a copy on stamped paper, and was in the act of signing his name when a difficulty arose for which we were quite unprepared. After having written his name, he was utterly unable to make the flourish. In vain he struggled to overcome the difficulty. A hundred times at least he went through the requisite movements with his hand raised above the paper—proving that the obstacle was not in the hand; a hundred times the will was unable to command the fingers to bring the pen down to the paper. Mr. P. was in an agony. He would rise from the desk with impatience, and stamp on the floor: then he would sit down again and try once more. Still he could not bring the pen to the paper. Will any one deny Mr. P.'s strong desire of completing his signature or assert that he does not understand the importance of the act? Will any one question the soundness of the organ that has to execute the flourish? The agent (the hand) seems to be as free from defect as the legal instrument, but the former cannot apply itself to the latter. Plainly the will is at fault. This struggle lasted three quarters of an hour. At last the effort had some result, after I had given up all expectation of any. The flourish was very imperfect, but it was executed. I was an eye witness of this struggle, taking the liveliest interest in it, and I declare that

* "Confessions of an Opium Eater," Boston edition, 1851, p. 106 *et seqq.*

it was impossible to give more manifest proof of the impossibility of willing, in spite of the desire.*

"A few days later I observed another instance of disability of a kindred nature. It was proposed to go out for a little while after dinner. Mr. P. wished very much to do so, desiring, as he told me, to get some idea of the appearance of the city. For five days in succession, he took his hat, arose from table, and got ready to go out. Vain hope! His will could not command his legs to put themselves in motion, and carry him into the street. 'Evidently I am my own prisoner,' he would say; 'it is not you that prevent me from going out, nor is it my legs that refuse; then what is it?' Thus would Mr. P. complain of his *not being able to will*, much as he wished it. At last, after five days, he made a final effort, and succeeded in getting out of doors, but five minutes later he came back perspiring and out of breath, as though he had run a distance of several kilometers, and much astonished himself at what he had just done.

"Instances of such inability were occurring every moment. If the patient longed to go to the theater, he could not will to go. If at table with agreeable company he wished to take part in the conversation, the same inability was experienced. True, oftentimes this lack of force existed, so to speak, in apprehension only: the patient feared lest he should not be able, and yet he succeeded in more instances than he failed: often however, it must be admitted, his apprehensions were justified."

After passing six days at Marseilles, patient and physician took ship for Naples, "though not without the utmost difficulty." During these six days

"the patient formally expressed his disinclination to embark, and his desire of going back to Paris, dreading in advance the thought of finding himself, with his diseased will, in a strange country, and declaring that he would have to be taken on board in irons. On the day appointed for sailing, he made up his mind to leave the hotel only when he believed that I was about to resort to force. Once outside the door, he stopped on the street, and there no doubt would have remained, were it not for the intervention of some sailors, and they had only to show themselves.

"Another circumstance goes to show still further the lesion of the will. We reached Rome on the day of Pius the Ninth's election. 'This is a fortunate circumstance, I should say,' he remarked, 'were I not ill. I wish I could assist at the coronation, but I do not know that I can. I shall try.' On the morning of the day he arose at five o'clock, shaved, took out his black coat, etc., and said to me, 'You see I am doing a good deal; I do not yet know whether I shall be able to go.' At last, when the hour for the ceremony was come, he made a great effort, and with much ado succeeded in going down stairs. Ten days afterward, on the feast of St. Peter, after making the like preparations, and the same efforts, no result was reached. 'You see,' he said, 'I am still my own prisoner. It is not the wish that is wanting seeing that I have been getting ready for the last three hours. Here I am dressed, shaven and gloved, yet I cannot budge from here.' In short it was impossible for him to attend the ceremony. I had used a good deal of urgency, but judged that I must not force him.

"I will conclude this narrative, already too long, with one observation. It is that the instinctive movements—those which are not subject to the will proper—were not affected in this patient like those which may be called the ordinated movements. Thus, on arriving at Lyons, upon our return journey, our coach ran over a woman that the horses had thrown down: my patient regained all his energy, and not waiting for the vehicle to stop, threw off his cloak, opened the door, and was the first to descend and offer assistance to the woman."

The author adds that the voyage had not the good effect he had anticipated; that the patient however felt better when riding in a carriage, especially in a jolting vehicle over a rough road; and thus he went home to his family in about the same state.*

The cases just cited represent a very definite group. From them we gather some very precise facts, and a few highly probable inferences. And first let us consider the facts.

1. The muscular system and the organs of movement remain intact: they offer no impediment. The automatic activity which constitutes the ordinary routine of life persists.

2. The intelligence is intact—at least there is nothing that would warrant us in saying that it has suffered in the least. Ends are clearly apprehended, means likewise, but to pass to action is impossible.

Here then we have a disease of the will in the strictest sense. And we may remark that disease makes for our behoof a curious experiment. It creates exceptional conditions, such as can be produced in no other way: it makes two halves of the man, utterly extinguishing all power of individual reaction, but leaving intact all else; it produces for us, so far as the

* *Je déclare qu'il était impossible de constater plus manifestement une impossibilité de vouloir, malgré le desir.* I transcribe this observation literally, without any reflection upon the author's psychological doctrine. (Author's note.)

* "Annales Médico-Psychologiques," vol. x.

thing is possible, a being reduced to pure intelligence.

Whence comes this impotence of will? Here the inductions begin. As to its immediate cause two hypotheses only are possible: it consists of an impairment either of the motor centers or of the incitements they receive.

The first hypothesis has no valid reason to rest on.* At least we know too little about this matter to warrant even conjecture.

The second hypothesis remains. Experience confirms it. Esquirol has preserved for us the remarkable answer made to him by a patient who had been cured: "This lack of activity was owing to the fact that my sensations were too faint to exert any influence on my will." The same author has also noted the profound change such patients experience in their general sense of existence (cœnæsthesia). "My existence is incomplete," writes one of his patients to him. "The functions, the power of performing the ordinary acts of life, remain with me: but in the performance of them there is always something wanting, to wit, the sensation proper to each and the pleasure that follows them. Each one of my senses, each part of myself is, so to speak, separated from me, nor can it now procure for me any sensation." No psychologist could better define the point at which the affective life of the patient was impaired.

Billod relates the case of a young Italian woman "of brilliant education" who became insane from having been crossed in love; she recovered, but afterward fell into a profound apathy. "She reasons soundly on every subject, but no longer has any power of will or of love; no consciousness of what happens to her, of what she feels or of what she does. She says she is as one that is neither dead nor alive; like one living in continual sleep, to whom objects appear as though wrapt in a cloud, to whom persons seem to move like shadows, and words to come from a world far away." †

If, as we shall see later, the voluntary act is made up of two distinct elements, viz., a state of consciousness totally incapable either of producing action or prohibiting it, and organic states which alone have this power, then it must be admitted that the two elements, though usually they are simultaneous, as being the effects of one same cause, are here dissociated. The inability to act is a fact. But the intensity of the state of consciousness, which intensity is clearly intermittent—is that a fact? If so, then we must say that the requisite conditions are present here, but only so far as this element is concerned. But is this intensity of consciousness an illusion? I am inclined to believe that it is. The strong desire to act that some of the patients suppose themselves to have seems to me to be simply an illusion of consciousness. The intensity of a wish is something entirely relative. The patient being in a state of general apathy, an impulse that to him appears to be strong is in fact below the average: hence inaction. When we come to study the state of the will in somnambulism we shall see that though some patients firmly believe their acts while in that state to be controllable by their will, experience at last compels them to admit that this judgment is erroneous and that their consciousness deludes them completely.*

When however an excitation happens to be very strong, sudden, unexpected, that is when it combines all the conditions of intensity, then in most cases it serves as an impulse to action, as in the case of the patient who recovered his energy to save a woman from being run over.† Every one can realize for himself this state of aboulia, for there is no one but has had his hours of weakness when all incitements, whether inward or outward, all sensations and all ideas have been ineffective, leaving him impassive. Between this state and aboulia there is only a quantitative difference—the difference between a transient and a chronic state.

If these patients are unable to will the reason is that however many projects they may conceive, only a feeble desire to act is awakened. I employ these terms in order to conform myself to the current phraseology, still it is not the weakness of the desire, as a simple state of consciousness, that produces inaction. To infer that it is, is to reason from mere appearances. As we have already shown, every nervous state—every sensation, every idea—is all the more surely translated into movement, as it is accompanied by those other nervous states, whatever they may be, which correspond to feeling and sentiment. It is from the weakness

* It must be remembered that we are speaking not of the motor organs, but of the *centers*, whatever opinion may be held as to their nature and their localization.

† "Annales Médico-Psychologiques," *ubi supra*.

* See Chapter VI., *infra*.

† I learn from Dr. Billod that this patient regained his activity, in consequence of the events of June, 1848, and the emotions they excited in him.

of these states that aboulia results, and not from weakness of desire, which is only a sign.

The cause therefore is a comparative insensibility, a general impairment of sensibility: that which is impaired is the affective life, the emotional faculty. But whence comes this morbid state? The question is purely a physiological one. Indisputably there exists in these patients a notable depression of the vital activities; and this may attain to such a degree as to involve all the faculties, so that the individual becomes like some inanimate thing. Physicians call this state melancholia, lypemania, stupor, and its symptoms are a slowing of the circulation, a lowering of the temperature of the body, and an almost absolute immobility. These extreme forms do not belong to our theme, but they exhibit to us the ultimate causes of impotence of the will. Every depression in the vital tone, be it slight or be it grave, transient or lasting, has its effect. So little is the will like a faculty controlling as a master, that it depends momentarily upon the most trivial causes: it is at their mercy. And yet, inasmuch as it has its source in biological actions that take place in our inmost tissues, we see how truly it is said to be our very self.

The second group is like the first in its effects (impairment of the will) and in its causes (depressive influences). The only difference is that the incitement to act is not suppressed. The first group presents positive causes of inaction; the second, negative causes. Inhibition results here from an antagonism.

In all the cases now to be mentioned the impairment of the will springs from a sense of fear, based on no rational ground, and varying from simple anxiety to anguish and paralyzing terror. In some instances the intelligence appears to be intact, in others impaired. Again, some of these cases are of an indefinite character, and it is difficult to say whether they indicate a disease of the will alone.*

The following case shows the transition from one group to the other; in fact it belongs to both. "A man of 30 years found himself involved in certain civic tumults which frightened him greatly. Thereafter, though he retained perfectly his mental balance, managing his private affairs very well and carrying on a large business, he would not remain alone either on the street or in his chamber, but was always accompanied. If he went out, it was impossible for him to return home alone. Whenever he went out unattended, which he rarely did, he would soon halt on the street, and there remain indefinitely, neither going on nor turning back, unless some one led him. He seemed to have a will, but it was the will of those around him. Whenever the attempt was made to overcome this resistance of the patient, he would fall into a swoon."*

Several alienists have recently described under the names of "peur des espaces," "Platzangst," and agoraphobia, a curious sort of anxiety that paralyzes the will, and against which the individual is powerless to react, or at least does so only in a roundabout way. A case observed by Westphal may serve as a type. A traveler of strong constitution, perfectly sound of mind and presenting no disorder of the motor faculty, is suddenly seized with a feeling of alarm at the sight of an open space—as a public square—of some little size. If he must cross one of the great squares of Berlin, he fancies the distance to be several miles and despairs of ever reaching the other side. This feeling grows less or disappears if he goes around the square, following the line of houses, also if he has some person with him, or even if he supports himself on a walking cane. Carpenter† quotes from Bennett a case of "paralysis of the will" which seems to me to belong to the same class. "If when walking in the street this individual [a patient of Dr. Bennett's] came to a gap in the line of houses, his will suddenly became inoperative and he could not proceed. An unbuilt-on space in the street was sure to stop him. Crossing a street also was very difficult, and on going in or out of a door he was always arrested for some minutes."

Again, some persons while walking in the open country are more or less uneasy unless they keep close to the hedges or to the trees. Many other illustrations might be given, but that is needless, for they would add nothing to the fundamental fact.‡

* Here it is well to remark once for all that, as we are studying the diseases special to the will, we have had to eliminate all cases where the psychic activity is affected as a whole, and those in which affections of the will are only the effect and the expression of intellectual insanity.

* Billod, *loc. cit.*, p. 191.

† Op. cit., p. 385.

‡ For further details see Westphal, "Archiv für Psychiatrie," vol. iii. (two articles); Cordes, *ibidem*; Legrand du Saulle, "Annales Médico-psychologiques" (1876), p. 405; Ritti, "Dictionnaire Encyclopédique des Sciences Médicales," art. FOLIE AVEC CONSCIENCE; Maudsley, "Pathology of Mind."

The medical discussions of this morbid state do not concern us here. The psychological fact is reducible to a sense of fear, and that this fear is puerile and imaginary as regards its causes makes no difference for us: we have to do only with its effect, which is to disable the will. But we must inquire whether this depressive influence only arrests the will-impulse, the latter being in itself intact, or whether the power of individual reaction also is weakened. The latter hypothesis is well grounded for, the sense of fear not being insurmountable—as these patients prove in some instances—we must infer that the individual's power of reaction is fallen below the general level. Hence the arrest of volition results from two causes acting in the same direction.

Unfortunately we are ignorant of the physiological conditions of this impairment. Many are the conjectures that have been made. Cordes, himself subject to this infirmity, regards it as "a functional paralysis symptomatic of certain modifications of the motor centers, and capable of producing upon us impressions, in particular an impression of fear, which gives rise to a momentary paralysis; this effect is almost nothing if the imagination alone is in play, but it is carried to a very high degree by the operation of the accompanying circumstances." According to Cordes, then, the primary cause is "a paresic exhaustion of the motor nervous system, of that portion of the brain which governs not only locomotion but muscular sensibility also."

This explanation, were it firmly established, would be of great consequence for our research. It would show that the impotence of the will depends on an impotence of the nerve centers—and this would have the advantage of supplying to our inquiries an assured basis in physiology. But it would be premature to draw here conclusions that will come in more fitly at the end of our work.

I shall have little to say of the mental state denominated "grübelsucht." It represents the pathological form of irresolution of character, just as aboulia represents that of the apathetic character. It consists of a state of continual hesitation, for the most frivolous reasons, with inability to reach any definitive results. This hesitation is seen at first in the purely intellectual order. The patient keeps asking himself questions continually. I take an illustration from Legrand du Saulle. "A very intelligent woman could not go into the street but she would be asking herself, 'Is some one going to jump out of a window and fall at my feet? Will it be a man or a woman? Will the person be wounded or killed? If wounded, will it be in the head or the legs? Will there be blood on the pavement? Shall I call for assistance, or run away, or recite a prayer? Shall I be accused of being the cause of this occurrence? Will my innocence be admitted?' and so on. These questionings go on without end. Several cases of a like nature are recorded in special treatises." *

If it involved only this "psychological rumination,"—to use Mr. du Saulle's expression—we should have nothing to say about this morbid state; but the perplexity of the mind expresses itself in acts. The patient durst not attempt anything without endless precautions. If he has written a letter, he reads it over and over again, for fear he should have forgotten a word or committed some fault of spelling. If he locks a drawer, he must make sure again and again that it was done aright. It is the same as to his dwelling: he has to satisfy himself repeatedly as to the doors being locked, the keys in his pocket, the state of his pocket, etc.

In a graver form of the malady the patient, haunted by ridiculous abhorrence of contact with anything dirty or unclean, will not touch a piece of money, a door knob, a window fastening or the like; and he lives in a state of constant apprehension. Such was the cathedral beadle mentioned by Morel, who, worried for twenty-five years by absurd fancies, feared to touch his staff; the man would reason with himself, and rail at himself till his apprehensions were counteracted, yet he always was afraid that the next time he should not succeed.†

This malady of the will results in part from weakness of character, in part from the state of the intelligence. It is quite natural that this current of vain imaginings should find expression in frivolous acts; but the impotence of the individual reaction plays an important part. We find also a lowering of the general tone, and the proof of this is seen in the causes of this morbid state, namely hereditary neuropathy and debilitating maladies; also in the crises and the syncope brought on by the effort to act; so too in those extreme forms of the disease where

* See particularly Legrand du Saulle, "La Folie du Doute avec Délire du Toucher" (1875); Griesinger, "Archiv für Psychiatrie" (1869); Berger *ibidem* (1876); Ritti, "Dict. Encycl," *loco citato*.

† "Archives Générales de Médecine" (1866).

the patient, harassed by his unceasing apprehensions, will neither write, nor listen, nor speak, but keeps muttering to himself, or perhaps only moving his lips.

Finally let us notice those cases in which the impairment of the will approaches extinction. When a persistent state of consciousness is accompanied by an intense feeling of terror, there is produced an almost absolute inhibition, and the patient seems stupid without really being so. Such was the case with the young man mentioned by Esquirol, who appeared to be idiotic, who had to be dressed, put to bed, fed like a child, and who after his recovery declared that an inward voice used to say to him, "Do not budge, or you are dead."*

Guislain also reports a curious case, but in this instance the lack of psychological data leaves us in a quandary and no positive explanation can be offered. "A young lady, courted by a young man, was seized with an alienation of mind the true cause of which was unknown, but its distinctive feature was a strong aversion to society, which soon was transformed into a morbid mutism. During twelve years she made answer to questions only twice, the first time under the influence of her father's imperative words, and the second time on her being committed to an asylum. On both occasions she was strangely, surprisingly laconic."

For two months Guislain made repeated efforts to effect a cure. But "my efforts were vain, and my exhortations without effect. I persisted, and before long noted a change in her features, and a more intelligent expression in her eyes. Shortly afterward, from time to time, she would utter sentences, expressing her thoughts clearly, but this was at long intervals, for she manifested extreme repugnance to comply with my requests. It was evident that her self-love was each time gratified by the victory she gained over herself. In her answers it was impossible to detect the slightest sign of disordered intellect: her insanity was purely a disease of the impulsive will. Oftentimes a sort of bashfulness seemed to restrain this patient, whom I was beginning to regard as convalescent. For two or three days she ceased to speak, and then, yielding to renewed solicitations, she recovered speech again, till finally she took part of her own accord in the conversation going on in her hearing. . . . This recovery is one of the most surprising instances of cure that have come under my observation." The author adds that restoration was complete and permanent.

This state of morbid inertia, of which aboulia is the type, where the "I will" is never followed by action, shows volition, as a state of consciousness, and the effective power of acting to be two distinct things. Not to dwell on this point at present, let us direct our attention to this fact of effort —a vital point in the psychology of the will, and which is lacking here.

The feeling of *muscular* effort has been studied so thoroughly and so minutely by Dr. William James* that there is no need of going over the ground again; it will suffice to recall his conclusions. That physiologist has shown that the sense of the muscular force expended in the performance of an act is a complex afferent sensation coming from the contracted muscles, the tense ligaments, the compressed articulations, the shut glottis, etc. He considers in detail, taking his stand upon the results of experiment, the opinion which holds it to be an *efferent* sensation connected with the motor discharge and coincident with the *outgoing* current of nervous energy. In particular he has shown, after Ferrier and other writers, that if in case of paralysis the patient retains the feeling of effort though quite unable to move the paralyzed member, the reason is because the conditions of the consciousness of effort persist, the patient moving the opposite member or organ.

But Dr. James justly distinguishes the *muscular* from the *volitional* effort which in many cases either involves no immediate movement at all, or only an exceedingly weak muscular energy. This we see in the case of the man who, after long hesitation, decides to put arsenic into his wife's glass to poison her: and every one is familiar through personal experience with this state of mental struggle in which the effort is all internal. But here we part regretfully with this author who locates this effort in a region apart and supersensible. To us it seems to differ from muscular effort only in this one point: its physiological conditions are ill understood, and we can offer only hypotheses.

There are two types of this volitional effort, of which the one consists in arresting the instinctive, the passional, the habitual movements, the other in overcoming languor, torpor, timidity. The one is an effort with a negative and the other an ef-

* Esquirol, vol. ii., p. 287.

* "The Feeling of Effort," Boston, 1880

fort with a positive result: the one produces inhibition the other impulsion. These two types may themselves be reduced to one formula: there is effort when the volition follows the line of greatest resistance. This volitional effort never takes place when the impulsion (or the inhibition) and the choice coincide, when our natural tendencies and the "I will" go in the same direction: in simpler language, when that which is *immediately* agreeable to the individual and that which is chosen by him are the same. It always takes place when two groups of antagonistic tendencies are struggling to supplant each other. As every one knows, this struggle takes place between the lower tendencies, whose adaptation is restricted, and the higher tendencies, whose adaptation is manifold. The former are always by nature the stronger; the latter are sometimes the stronger on account of adventitious circumstances. Again, the former represent a force enregistered in the organism; the latter a recent acquisition.

How comes it then that these naturally weaker tendencies prevail? It is because the "I will" is an element in their favor—this, of course, not inasmuch as it is a mere state of consciousness, but because underneath this volition there exist the causes known, half-known, or unknown which we have often designated by the term individual character. These minor active causes, which constitute the individual physically and psychically, are not mere abstractions: they are physiological or psychophysiological processes; they presuppose work done in the several nervous centers. Is it rash to maintain that the feeling of volitional effort too is an effect of these physiological processes? The only objection that can be urged is our inability to determine its mechanism. This point is all the more obscure because the mechanism must be different according as the effect to be produced is an impulsion or an inhibition; so too the feeling of volitional effort is not the same in the two cases.

The inward struggle is accompanied by a sense of fatigue often intense. Though we know but little about the nature and the causes of this state, it is generally supposed that even in muscular effort the seat of fatigue is in the nerve centers that call forth the contraction, not in the muscles: that there is nervous exhaustion, not muscular. In reflex contractions no fatigue is felt. Among subjects of hysteria contractions are seen to persist indefinitely, and yet the patient has no sense of lassitude; hence it is the voluntary effort that causes fatigue and not the contraction of muscle.*

Apart from our ignorance, we have no reason to attribute to the volitional effort a peculiar character. Are the nerve elements capable of furnishing a surplus of work for a given period in all cases where this volitional effort comes into play? Or, on the contrary, are they, owing to their nature or for the want of training and exercise, quickly exhausted and incapable of acquiring fresh strength? Have they or have they not a sufficiency of available force stored up? The problem of action in the direction of greatest resistance is reduced to its ultimate terms. It is this hidden, almost unsuspected work that makes itself known through the feeling of volitional effort. Hence the feeling of effort in all its forms is a subjective state corresponding to certain processes going on in the nerve centres and in other portions of the organism, but differing from them even as the sensation of light or of sound differ from their objective causes. To be capable of great muscular effort, the appropriate nerve centers must be able to produce a good deal of work for a prolonged period, and this depends on their constitution and on the rapidity with which they repair losses. So too, to produce a great moral or intellectual effort, the appropriate nerve centers, whatever they may be (and our ignorance touching this point is nearly total), must be able to produce intense work over and over again, and must not be quickly exhausted and slow to repair losses. The capacity for effort is therefore in the last analysis a natural gift.

To make our meaning clearer take the case of a vicious character. Suppose that never in his life, whether spontaneously or under the influence of others, he has experienced any faint desire of amendment: the reason is, because he entirely lacks the moral elements and their corresponding physiological conditions. Should the thought of amendment by any chance occur to him, it is to be remarked in the first place that this occurrence is no act of the will, though it supposes the preexistence of certain psychophysiological elements and their being called into play. Now suppose he elects to pursue this object, approves this course, wills it; if the

* Richet, "Physiologie des Nerfs et des Muscles," pp. 477-490; Delbœuf, "Étude Psychophysique," pp. 92 *et seqq.*, in "Éléments de Psychophysique," vol i.

resolution does not persist, it is because in the man's organization there exists no capacity for that iterated work of which we have spoken; but if the resolution does persist, it is because it is supported by an effort, by that inner work which produces arrest of the opposite states. Organs are developed by exercise, and this holds good here; so that repetition becomes easy. But if nature has laid no foundation, given no potential energy, there is no result. Hence the theological doctrine of grace as a free gift appears to be bottomed on a far more correct psychological theory than the opposite opinion,* and we see how easily it might be made to undergo a physiological transformation.

To return to the morbid forms that are the objects of our study, they involve a temporary, accidental incapacity for effort, which however extends to almost the entire organism.

CHAPTER III.

IMPAIRMENT OF THE WILL.—EXCESS OF IMPULSION.

We have just been considering instances in which, though the intellectual adaptation—that is the correspondence between the intelligent being and his environment—is normal, the impulse toward action is either null, very weak, or at least insufficient. In the language of physiology, the cerebral actions which are the basis of intellectual activity (as the thought of ends and of means, choice, etc.), remain intact, but they lack the concomitant states which are the physiological equivalents of the feelings, and the absence of these causes failure to act.

We are now to study phenomena quite the opposite of these in certain respects. In this second group the intellectual adaptation is very little, or at all events very instable; the motives dictated by reason are forceless either for action or for restraint; and the lower impulses gain what the higher impulses lose. The will, that is to say the rational activity, disappears, and the individual reverts to the domain of instinct. Nothing could prove more effectually that the will, in the strict sense of the term, is the crown, the final term of an evolution, the result of a multiplicity of disciplined tendencies coördinated with one another; that it is the most perfect species of activity.

Let us examine the facts. We will divide them into two groups: 1. Those which, being hardly if at all conscious, denote an absence rather than an impairment of will; 2. Those which are accompanied by perfect consciousness, but in which, after a longer or shorter struggle, the will succumbs, or is saved only by assistance from without.

1. In the former case "the impulsion may be sudden and unconscious, followed by immediate execution, the understanding even not having had time to take cognizance of it. . . . In such case the act possesses all the characters of a purely reflex phenomenon, without any intervention whatever of the will: it is in fact a convulsion differing from ordinary convulsions only in that it consists of movements associated and combined in view of a determinate result. Such is the case of the woman who, seated on a bench in a garden, oppressed with unwonted sadness, suddenly rose to her feet, threw herself into a ditch full of water, as if to drown herself, and who, after being rescued and restored to herself fully, declared a few days later that she was unconscious of having wanted to commit suicide and had no recollection of the attempt she had made." *

"I have seen," says Luys, "a number of patients who repeatedly attempted suicide in the presence of those who watched them, but they had no recollection of the fact in their lucid state. And what proves the unconsciousness of the mind under these conditions is the fact that the patients do not perceive the inefficiency of the methods they employ. Thus a lady who attempted suicide whenever she saw a table knife, did not notice one day when I was watching her that I had substituted for the knife a harmless instrument. Another patient tried to hang himself with a half rotten cord that was not strong enough to bear even slight tension." †

Impulses of this kind are so frequent among epileptics that pages might be filled with accounts of them. Hysterical patients too furnish innumerable examples: they manifest an uncontrollable tendency toward the immediate gratification of their caprices or the satisfaction of their wants.

Other impulsions produce effects that

* The doctrine of grace is found even among the Hindus, particularly in the "Bhagavad Gitâ," xi., 53. Consult Barth, "Les Religions de l'Inde," pp. 48, 136.

* Foville, "Nouveau Dictionnaire de Médecine," art. Folie, p. 342.

† "Maladies Mentales," pp. 373, 439, 440.

are less serious, but they indicate the same psychic state. "In some patients the overexcitation of the motor forces is such that they keep walking for hours at a time without stopping, never looking about them, like mechanical figures that have been wound up." "A marchioness possessed of very great intelligence," says Billod, "would in conversation interrupt a sentence with an unseemly or an obscene epithet addressed to some one in the company, and then take up the broken sentence again. The utterance of this epithet was accompanied by a blush; the lady seemed to be annoyed and confounded, and the word was as it were jerked out, like an arrow that is shot unawares from the bow." "An aged victim of hysteria, a woman of much intelligence and very clear-headed, used to feel at certain times the need of going into some lonely place and shouting aloud; there she would give vent to her grievances and her complaints against her family and her surroundings. She knew perfectly well that it was wrong to publish certain secrets, but, as she used to say, she must speak and satisfy her grudges."*

This last case brings us to irresistible impulses that are conscious. But at present we have to do with those which are unconscious. Cases of this kind we might cite in abundance. They exhibit the individual reduced to the lowest degree of activity—that of pure reflex action. His acts are unconscious (or at least not deliberate), immediate, irresistible, and their adaptation is of little complexity and invariable. Considered from the point of view of physiology and of psychology, the human being, under these conditions, is like an animal that has been decapitated, or at least deprived of its cerebral lobes. It is generally held that the brain can govern the reflex actions, and this opinion rests upon the following grounds: An excitation, starting from any point of the body becomes divided on reaching the spinal cord, and then pursues two routes. It is transmitted to the reflex center by a transverse route, and to the brain by a longitudinal and ascending route. Since the transverse route presents the greater resistance, transmission in that direction takes some time, while transmission longitudinally on the contrary is much more rapid. Hence there is time for the suspensive action of the brain to take place and to regulate the reflex actions. The brain being in the causes just mentioned without action, its activity remains at its lower degree and volition does not occur, its necessary and sufficient conditions not being present.

2. The phenomena of the second group are worthy of more detailed study: they explain the overthrow of the will and the artificial means that support it. The patient is fully conscious of his situation; he feels that he is not master of himself, that he is dominated by an inner force and irresistibly urged on to perform actions that he condemns. The intelligence remains sufficiently sane, and the insanity affects only the acts. We find in a work by Marc that is now almost forgotten* a rich collection of facts upon which later writers have freely drawn. We quote a few.

A lady subject at times to homicidal impulses used to request to be put under restraint by means of a strait waistcoat, and would let her keeper know when the danger was passed and when she might be allowed her liberty. A chemist haunted with similar homicidal impulses used to have his thumbs tied together with a ribbon, and in that simple restraint found the means of resisting the temptation. A servant woman of irreproachable character asked her mistress to let her go away, because she was strongly tempted to disembowel the infant she took care of whenever she saw it stripped. Another woman, a person of much intellectual cultivation and very affectionate to her relatives, "began to beat them in spite of herself and called for assistance, begging that she might be held down in an armchair." A victim of melancholia haunted with the thought of suicide arose in the night, knocked at his brother's door and cried out to him, "Come quick; suicide is pursuing me and soon I shall be unable to withstand it."

Calmeil in his "Traité des Maladies Inflammatoires du Cerveau" cites the following cases, of which he was a witness and which I will give in detail, for so I shall be dispensed from recounting many more:

"Glénadel having lost his father in childhood, was brought up by his mother who adored him. On attaining his 16th year his character underwent a change. Till then he had been a good and dutiful son, but now he became gloomy and taciturn. Being pressed

* Luys. *loco citato*, 167, 212; Billod, *loco citato*, 193 *sq.*

* "De la Folie considérée dans ses Rapports avec les Questions Médico-judiciaires." 2 vols. 8vo. Paris, 1840.

with questions by his mother, he at length resolved to make a confession:

"'To you I owe everything,' he said, 'and I love you dearly: still for the last few days a thought that is ever in my mind has been driving me to kill you. Do not let me at last give way to it, do not let so great a misfortune befall, but give me leave to enlist.' In spite of her urgent solicitations he was immovable in his resolution, left his home and made a good soldier; yet a lurking desire was ever urging him to desert, so that he might return and kill his mother. At the close of his term of service this thought was as strong as on the first day. He enlisted for another term, and still the homicidal instinct persisted, though now another victim was substituted. He no longer thinks of killing his mother; night and day he now is conscious of a horrid impulse to murder his step-sister. In order to withstand this second impulse he condemned himself to lifelong exile from his home.

"At this juncture a man from his own neighborhood joined the regiment, and to him Glénadel confided his distressing secret. 'Cheer up,' said the other, 'that crime is out of the question, for your step-sister died a short time ago.' On hearing these words Glénadel sprung to his feet like a captive set free. He was filled with joy and set out for his home, which he had not seen since his boyhood. Arrived there he saw his step-sister alive. He uttered a cry, and the terrible impulse instantly seized him again. That evening he had his brother to put him under restraint. 'Take a strong cord,' he said, 'and tie me up in the barn like a wolf, and send word to Dr. Calmeil.' The physician obtained for him admission to an asylum for the insane. On the eve of his admission he wrote to the director of the asylum: 'Sir, I am about to enter your establishment: I shall behave there as in my regiment. People will think I have recovered, and at times perhaps I shall feign recovery. You must not believe me, and I must never be permitted to leave under any pretext. When I beg to be allowed to go at large, redouble your vigilance, for the only use I shall make of that liberty will be to commit a crime I abhor.'"

It is not to be supposed that this case is unique or even a very uncommon one: in works on insanity we find recorded many instances of persons who, tormented by the impulse to kill those who are dear to them, take refuge in asylums, becoming voluntary prisoners.

The irresistible though conscious impulse to steal, to set fire to houses, to commit suicide by alcoholic excess, belongs to the same category.* Maudsley in his "Pathology of Mind" (Chapt. VIII.) presents so many examples that I cannot do better than to refer to that work. I thus spare the reader useless repetition. For me it suffices to point out the enormous multitude of facts which justify the considerations I am about to offer.

It is to be remarked that the transition from the sane state to these pathological forms is almost imperceptible. Persons that are perfectly rational experience insane impulses, but these sudden and unwonted states of consciousness are without effect, do not pass into acts, being suppressed by opposite forces, by the dominant mental habit. Between this isolated psychic state and the states antagonistic to it there exists so great a disproportion that there is even no struggle between them. In other cases, usually regarded as of very little moment, "there is some eccentricity of behavior but nothing reprehensible or dangerous—simple oddity, capriciousness. Or again, a person is given to acts which though not seriously compromising are nevertheless mischievous—as destroying or beating an inanimate object, tearing one's clothing, etc. We have at the present time under observation a young woman who chews up all her gowns. Then there is the oft quoted case of the art amateur who, happening at a museum to see a valuable painting, felt an instinctive impulse to punch a hole through the canvas. Oftentimes these impulsions go unnoticed, except by the consciousness of the one who experiences them."*

Sometimes fixed ideas of a character frivolous or unreasonable find lodgment in the mind which, though it deems them absurd, is powerless to prevent them from passing into acts. Many curious examples of this are to be found in a work by Westphal. A man, for instance, is haunted by the thought that perchance he might commit to writing that he has been guilty of some crime, and lose the paper. Accordingly he carefully preserves every bit of paper he finds, picks up paper on the streets to make sure that it contains no writing, takes it home and hoards it. He is fully conscious of the absurdity of the phantasy which worries him continually: he does not believe in it, nevertheless he is powerless to dismiss it.†

* See Trélat, "Folie Lucide;" Maudsley, "Crime and Insanity."

* Foville, *opus citatum*, p. 341.

† Westphal, "Ueber Zwangsvorstellungen," Berlin, 1877. We may add that the fear of doing an act sometimes leads one inevitably to do it. This we see illustrated in vertigo, when a person throws himself down in the street through fear of falling, when one wounds himself through fear lest he should wound himself, etc. These phenomena are explained by the nature of the mental representation, which by reason of its intensity passes into act

Between acts that are frivolous and those which are dangerous the difference is only quantitative: what the former exhibit to us foreshortened, the latter exhibit in enlarged proportions. We will try to explain the mechanism of this disorganization of the will.

In the normal state an end is chosen, approved, attained; that is to say the elements of the Ego, whether all or a majority of them, concur toward attaining it. Our states of consciousness—feelings and ideas, with their respective motor tendencies—and the movements of our members form a *consensus* that converges toward this end with more or less effort by means of a complex mechanism made up both of impulsions and inhibitions.

Such is the will in its perfect, typical form. But this is not a natural product; it is the result of art, of education, of experience. It is a structure that has been built up slowly, bit by bit. Observation both subjective and objective shows that each form of voluntary activity is the fruit of a conquest. Nature supplies only the raw material—in the physiological order a few simple movements, in the psychological order a few simple associations. To assist these simple and almost invariable adaptations, there must be formed other adaptations more and more complex and variable. For instance, the babe must acquire the power of using its legs, arms, and all the movable portions of its body, by means of experiment, combining the movements that are appropriate and suppressing those which are of no advantage. The simple groups so formed must be combined in complex groups, these into groups more complex still, and so on. A similar operation is necessary in the psychological order. What is complex is never won at the first effort.

But it is plain that in the edifice so built up little by little the original materials alone are stable, and that as complexity increases stability diminishes. The simplest actions are the most stable anatomically, because they are congenital, registered in the organism; and physiologically, because they are continually repeated in the experience of the individual, as also—if we take account of heredity, which opens up an illimitable field—in the innumerable experiences of the species and of all species.*

On the whole, the surprising thing is that the will, the complex and higher order of activity, should become predominant. The causes which raise it to that rank and hold it there are the same which in man raise and hold the intelligence above the sensations and the instincts: and taking humanity as a whole, facts prove the dominion of the one to be as precarious as that of the other. The great development of the mass of the brain in civilized man, and the influence of education and of the habits it produces, explain how it is that, in the face of so many adverse chances, rational activity so often retains the mastery.

The pathological facts that have been cited prove that the will is no entity reigning by right of birth, but a resultant that is always instable, always liable to break up, and in truth only a lucky accident. These facts—and they are innumerable—represent a state that may be regarded equally as a dislocation of the will and a retrograde form of activity.

If we study cases of irregular impulsions accompanied by full consciousness, we find that this subordination of tendencies—the will—is here broken in twain: for the *consensus* which alone constitutes the will is substituted a conflict between two groups of opposite and nearly equal tendencies, and hence it may truly be said that the will is dislocated.*

Considering the will not as a constituted whole but as the culminating point of an evolution, we must say that the lower forms of activity have the mastery and that the activity which is distinctively *human* retrogrades. We would observe however that the term "lower" has no moral implication here. One group is lower because it is evident that the activity which expends itself wholly in expressing a fixed idea or a blind impulse is by its nature restricted, adapted only to

* The will-power being constituted when certain groups of movements obey certain states of consciousness, we may cite as a pathological case the fact mentioned by Meschede ("Correspondenzblatt," 1874) of a man who "found himself in this curious condition, that when he would do anything, whether of his own accord or at the instance of others, he, or rather his muscles, did just the contrary. If he would look to the right, his eyes turned to the left; and this anomaly extended to all his movements. It was simply a contra-direction of movement without any mental derangement, and it differed in this from involuntary movements, that he never produced a movement save when he willed it, though the movement was always the reverse of what he willed."

* We might show, were this the place, how fickle a thing is the unity of the Ego and how unreliable. In these cases of conflict which is the true Ego, that which acts or that which resists? If you decide in favor of neither, then there are two Egos. If you decide in favor of either, you must admit that the preferred group represents the Ego about as in politics the party that is slightly in the majority represents the state. But these questions cannot be discussed incidentally. I hope some day to devote a monograph to them.

the present and to a very small number of circumstances, while rational activity on the other hand transcends the present and is adapted to a great number of circumstances.

It must be admitted, though language does not lend itself readily to such a form of expression, that the will, like the intelligence, has its idiots and its geniuses, with all the degrees intermediate between these two. From this point of view the cases cited in the first group (impulses not attended by consciousness) would represent will-idiocy, or, in more precise language, will-dementia; the facts of the second group would exhibit a weakness of will analogous to weakness of intellect.

Pursuing our research, we must now pass to an analysis of the facts and must determine their causes. Is it possible to ascertain the conditions upon which this weakening of the higher activity depends? First of all we have to inquire whether the overthrow of the will is an effect of the predominance of the reflex actions, or whether on the contrary it is the cause of that predominance: in other words, whether the weakening of the will is the primary or the secondary fact. This question admits of no general answer. Observation shows that both propositions are true with respect to different cases, and consequently we can give only a special answer for a special case whose circumstances are fully known. No doubt oftentimes the irresistible impulse is the *origo mali:* it constitutes a permanent pathological state. There is then produced in the psychological order a phenomenon analogous to hypertrophy of an organ, or to the overproliferation of a tissue, as for example that which leads to the formation of certain forms of cancer. In both instances, whether the physiological or the psychological, this vicious development makes itself felt throughout the entire organism.

The cases wherein voluntary activity is affected directly and not as an indirect effect, are of most interest for us. What takes place in such cases? Is it the power of coördination or the power of inhibition that is affected, or both? An obscure point upon which only a conjecture may be offered. To obtain some light upon it, let us investigate two new groups of facts, viz., the artificial and momentary impairment of the will produced by intoxication; and the chronic impairment produced by lesion of the brain.

As every one knows, the intoxication caused by alcoholic liquors, by hashish, by opium, after a first period of superexcitation brings about a notable impairment of the will. The individual is more or less conscious of this: other persons see it more distinctly. Soon—especially under the influence of alcohol—the impulsions become excessive. The extravagances, violences and crimes committed in this state are innumerable. The mechanism of the onset of intoxication is subject of warm controversy. It is generally supposed that it begins with the brain, later acting upon the spinal cord and the medulla, and lastly upon the great sympathetic. There is produced an intellectual hebetude—that is to say, the states of consciousness are vague, indefinite, of little intensity: the physiopsychological activity of the brain is reduced. This decline of activity extends also to the motor power. Obersteiner has proved by experiments that under the influence of alcohol one reacts less promptly, though he imagines that the contrary is the fact.* It is not the ideation alone that is affected but also the ideomotor activity. At the same time the power of coördination becomes null or ephemeral and forceless. Now since coördination consists both in converging certain impulsions toward an end and in directing impulsions that are useless or antagonistic to that end, it follows from the fact that the reflex actions are excessive or violent in any case, that the power of inhibition—whatever may be its nature and mechanism—is impaired, and that its part in constituting and maintaining will-action is all-essential.

The pathology of the brain affords other confirmatory facts, all the more striking because they show a sudden and permanent change in the individual. Ferrier and other writers cite cases where lesion of the frontal convolutions, especially the first and second, led to almost total loss of will, and reduced the patient to automatism, or at least to that state wherein the instinctive activity reigns almost alone, without possibility of inhibition.

An infant was wounded by a knife in the frontal lobe. Seventeen years afterward his physical health was good, "but he was incapable of occupations that demanded mental exertion. He was irritable, especially when he drank intoxicating

* "Brain," Jan., 1879. A considerable number of experiments have been made with respect to this point, with uniform results. See Exner, in "Pflüger's Archiv," 1873; Dietl and Vintschgau, *ibidem*, 1877; also an account of an important research made by Kræpelin in Wundt's psychophysiological laboratory, published in "Philosophische Studien," pp. 573 *seqq*.

liquor or when he was under any extraordinary excitement." A patient of Lepine's suffering from an abscess in the right frontal lobe "was in a state of hebetude. He seemed to understand what was said to him, but only with difficulty could he pronounce a word. On being bidden he would sit down; raise him from the chair and he could walk a few steps unassisted." A man who had received a violent blow which destroyed the greater part of the first and second frontal convolutions "lost all will-power. He understood what was said and acted as he was bid to act, but in an automatic, mechanical way."

Many similar cases are on record,* but the one which is most important for us is that of the "American carrier." A bar of iron shot from a mine passed through his skull, injuring only the præfrontal region. He recovered and survived the accident twelve years and a half; but of the patient's mental state after recovery the following particulars are given: His employers, who before the accident regarded him as one of their best foremen, found him so changed that they could not restore him to his former position. The equilibrium, the balance between his intellectual faculties and his instinctive tendencies, seemed to have been destroyed. He had become nervous, disrespectful and grossly profane. He showed now but little politeness to his equals, was impatient of contradiction, and would listen to no advice that ran counter to his own ideas. At times he was exceedingly obstinate, though capricious and indecisive. He would make plans for the future, and forthwith reject them and adopt others. He was a child intellectually, a man in passions and instincts. Before the accident, though he had not received a school education, he had a well-balanced mind, and was regarded as a man of good natural ability, sagacious, energetic and persevering. In all these respects he was now so changed that his friends said they no longer recognized him.†

In this case we see the will impaired in proportion as the inferior activity becomes stronger. Furthermore we have here an *experiment*, for here is a sudden change brought about by an accident under clearly defined circumstances.

It is to be regretted that we have not many observations of this kind, for with their aid a great deal might be done toward the interpretation of the diseases of the will. Unfortunately the researches so vigorously prosecuted with regard to localization of functions in the brain have had to do mostly with the motor and the sensorial regions, and these, as we know, occupy only a portion of the frontal region. So too there is need of a critical examination of the opposite class of facts, those namely which go to show that though the brain has suffered lesion, the will-power is apparently undiminished. This work accomplished, then Ferrier's theory that there exist in the frontal lobes centers of inhibition for the intellectual operations, would assume greater consistence and would supply a solid basis for the determination of the causes. As things stand, we may not attempt anything beyond conjectures.

When we compare the case of aboulia with that of the existence of irresistible impulses, we see that in the two cases will is in default owing to totally opposite conditions. In the one case the intelligence is intact, but impulsion is wanting; in the other, the power of coördination and of inhibition being absent, the impulse expends itself in purely automatic fashion.

CHAPTER IV.

IMPAIRMENT OF VOLUNTARY ATTENTION.

WE are now to study impairment of the will in a less striking form, namely, impairment of the power of *voluntary attention*. This does not in its essence differ from the impairments belonging to the group we have just been considering, since like them it consists in an impairment of the power of directing and of adaptation. It is a diminution of will-power in the strictest, straitest, and narrowest sense of the term, and it is indisputable even in the eyes of those who restrict themselves most obstinately to interior observation.

Before we turn our attention to acquired impairment, let us consider *congenital* impairment of voluntary attention. We will take no note of narrow or mediocre minds, in which feelings, intelligence and will are at one dead level of weakness. It is more interesting to study a great mind, some man gifted with high intelligence, with a quick sensibility, but who lacks the power of direction: thus we shall see a perfect contrast between thought and will. We have in Coleridge an instance of this.

* See Huxley's essay on "Animal Automatism." It will be published in No. 53 HUMBOLDT LIBRARY.
† Ferrier, "Localization of Diseases of the Brain."

"There was probably no man of his time or perhaps of any time who surpassed Coleridge," says Dr. Carpenter,* "in the combination of the reasoning powers of the philosopher with the imagination of the poet and the inspiration of the seer; and there was perhaps not one of the last generation who has left so strong an impress of himself in the subsequent course of thought of reflective minds engaged in the highest subjects of human contemplation. And yet there was probably never a man endowed with such remarkable gifts who accomplished so little that was worthy of them, the great defect of his character being the want of Will to turn his gifts to account; so that with numerous gigantic projects constantly floating in his mind, he never brought himself even seriously to attempt to execute any of them. It used to be said of him that whenever either natural obligation or voluntary undertaking made it his *duty* to do anything, the fact seemed a sufficient reason for his not doing it. Thus at the very outset of his career, when he had found a bookseller generous enough to promise him thirty guineas for poems which he recited to him, and might have received the whole sum immediately on delivering the manuscript, he went on week after week begging and borrowing for his daily needs in the most humiliating manner, until he had drawn from his patron the whole of the promised purchase money, without supplying him with a line of that poetry which he had only to *write down* to free himself from obligation. The habit of recourse to nervine stimulants (alcohol and opium) which he early formed and from which he never seemed able to free himself doubtless still further weakened his power of volitional self-control, so that it became necessary for his welfare that he should yield himself to the control of others.

"The composition of the poetical fragment 'Kubla Khan' in his sleep, as told in his 'Biographia Litteraria,' is a typical example of automatic mental action. He fell asleep whilst reading the passage in 'Purchas's Pilgrimage' in which the 'stately pleasure house' is mentioned, and on awaking he felt as if he had composed from two to three hundred lines, which he had nothing to do but to write down, 'the images rising up as things, with a parallel production of the correspondent expressions, without any sensation or consciousness of effort.' The whole of this singular fragment as it stands, consisting of fifty-four lines, was written as fast as his pen could trace the words; but having been interrupted by a person on business who stayed with him above an hour, he found to his surprise and mortification that 'though he still retained some vague and dim recollection of the general purport of the vision, yet with the exception of some eight or ten scattered lines and images, all the rest had passed away like the images on the surface of a stream into which a stone has been cast, but, alas! without the after-restoration of the latter.'"

Dr. Carpenter then quotes the description of Coleridge given in Chapter VII. of Carlyle's "Life of John Sterling":

"Coleridge's whole figure and air, good and amiable, otherwise, might be called flabby and irresolute, expressive of weakness under possibility of strength. He hung loosely on his limbs, with knees bent and stooping attitude. In walking he rather shuffled than decisively stepped; and a lady once remarked he never could fix which side of the garden walk would suit him best, but continually shifted in corkscrew fashion and kept trying both.

"Nothing could be more copious than his talk; and furthermore it was always virtually or literally of the nature of a monologue; suffering no interruption however reverent: hastily putting aside all foreign additions, annotations or most ingenious desires for elucidation as well-meant superfluities which would never do. Besides it was talk not flowing any whither like a river, but spreading everywhither in inextricable currents and regurgitations like a lake or sea; terribly deficient in definite goal or aim, nay, often in logical intelligibility; *what* you were to believe or do on any earthly or heavenly thing, obstinately refusing to appear from it. So that most times you felt logically lost, swamped, near to drowning in this tide of ingenious vocables spreading out boundless as if to submerge the world.

"He began anywhere. You put some question to him, made some suggestive observation; instead of answering this or decidedly setting out toward answering it, he would accumulate formidable apparatus, logical swim-bladders, transcendental life-preservers and other precautionary and vehiculatory gear for setting out; perhaps did at last get under way, but was swiftly solicited, turned aside by the glance of some radiant new game on this side or that into new courses and ever into new, and before long into all the universe, where it was uncertain what game you would catch or whether any. His talk, alas! was distinguished like himself by irresolution: it disliked to be troubled with conditions, abstinences, definite fulfilments; loved to wander at its own sweet will and make its auditor and his claims and humble wishes a mere passive bucket for itself.

"Glorious islets too, balmy, sunny islets of the blest and the intelligible I have seen rise out of the haze, but they were few and soon swallowed in the general element again.

"Eloquent, artistically expressive words you always had; piercing radiances of a most subtle insight came at intervals; tones of noble pious sympathy, recognizable as pious though strangely colored, were never wanting long; but in general you could not call this aimless, cloud-rapt, cloud-based,

* "Mental Physiology," pp. 266–7.

lawlessly meandering human discourse of reason by the name of 'excellent talk,' but only of 'surprising,' and were bitterly reminded of Hazlitt's account of it: 'Excellent talker, very—if you let him start from no premises and come to no conclusion.'"

We now turn to familiar instances of *acquired* impairment of voluntary attention. It occurs in two forms. The first is characterized by excessive intellectual activity, superabundance of states of consciousness and abnormal production of feelings and ideas in a given time, as we have seen when speaking of alcoholic intoxication. This exuberance of cerebral activity is more noticeable still in the more intellectual intoxication produced by hashish and opium. The individual feels himself to be overwhelmed by the irresistible tide of his ideas, and language is too slow to render the rapidity of his thoughts; but at the same time the power of directing the course of his ideas becomes weaker and weaker, and the lucid moments shorter and shorter.* This state of psychic exuberance, whatever its cause, —fever, cerebral anæmia, emotion— always has the same result.

Between this state and attention there is a perfect antagonism: one excludes the other. We have here in fact only a special case of excessive reflex action, only that here we have to do with psychic reflex action. In other words all states of consciousness tend to expend themselves, and this they can do only in two ways, either by producing a movement, an act; or by calling forth other states of consciousness, according to the law of association. The latter process is a case of reflex action of a complex kind—psychic reflex action—but like physiological reflex action it is only a form of automatism.

The second form brings us back to the type of aboulia. It consists in a progressive diminution of the directive power and eventual impossibility of intellectual effort.

"In the incipient stage of disease of the brain," says Forbes Winslow,† "the patient complains of an incapacity to control and direct the faculty of attention. He finds he cannot without an obvious and painful effort accomplish his usual mental work, read or master the contents of a letter, newspaper or even a page or two of a favorite book. The ideas become restive and the mind lapses into a flighty condition, exhibiting no capacity for continuity of thought.

"Fully recognizing his impaired and failing energies, the patient repeatedly tries to conquer the defect, and seizing hold of a book, is resolved not to succumb to his sensations of intellectual incapacity, physical languor and cerebral weakness; but he often discovers (when it is too late to grapple with the mischief) that he has lost all power of healthy mental steadiness, normal concentration, or coördination of thought. In his attempt to comprehend the meaning of the immediate subject under contemplation, he reads and re-reads with a determined resolution, and apparently unflagging energy, certain striking passages and pages of a particular book, but without being able to grasp the simplest chain of thought, or follow successfully an elementary process of reasoning; neither is he in a condition of mind fitting him to comprehend or retain for many consecutive seconds the outline of an interesting story, understand a simple calculation of figures or narrative of facts. The attempt, particularly if it be a sustained one, to master and converge the attention to the subject which he is trying to seize, very frequently increases the pre-existing confusion of mind, producing eventually physical sensations of brain lassitude and headache."

Many general paralytics, after passing through the period of intellectual overactivity—the period of gigantic projects, of immoderate purchases, of purposeless voyages, of incessant loquacity, during which the will is dominated by the reflex actions, reach later the period when it is impotent from atonicity: effort persists but for a moment, till at last this ever increasing passivity ends in dementia.*

The reader sees without any commentary that the diseases of voluntary attention are reducible to the types already considered. It will be best therefore without citing any further instances to inquire what instruction may be derived from that state of the mind called attention, as to the nature of the will, and what suggestions bearing upon the present research. For this purpose it is not necessary that we make a study of attention, however interesting, however ill-understood that subject may be. The question

* Moreau, "Du Hashish et de l'Aliénation Mentale," p. 60; Richet, "Les Poisons de l'Intelligence," p. 71.

† "On Some Obscure Diseases of the Brain and Mind," chap. xii.

* Of this class of patients some, but they are few pass through a period of struggle which shows wherein the will is master and how it eventually succumbs. "I have seen at Bicêtre," says Billod, "a general paralytic whose *délire des grandeurs* was of the most ultra type, escape from the establishment and go barefoot through a driving rain storm and in the middle of the night from Bicêtre to Batignolles. The patient remained outside for a whole year, during which he struggled with all his will against his intellectual delirium, knowing well that should he betray the first symptom of insanity, he would be sent back to Bicêtre. He came back nevertheless. I have met with several other instances of soundness of will persisting for a considerable time in general paralytics."

can be considered here only in part, that is so far as it concerns the will. I shall restrict my conclusions upon this point to the following propositions:

1. Voluntary attention, which is commonly credited with marvelous feats, is only an imitation, artificial, instable and precarious, of spontaneous attention.

2. The latter alone is natural and effective.

3. It depends, as regards its origin and its permanence, upon certain affective states, upon the presence of agreeable or disagreeable *feelings:* in a word it is sensitive in its origin, and hence allied to the reflex actions.

4. The inhibiting action appears to play an important but as yet indefinable part in the mechanism of attention.

To establish these propositions it is well first to examine spontaneous attention, considering it in all its different forms. The crouching animal watching its prey; the child intently gazing at a commonplace spectacle; the assassin awaiting his victim in a nook of a wood—here the mental image takes the place of the real object; the poet contemplating an inward vision; the mathematician studying out the solution of a problem:* all present essentially the same interior and exterior characters.

With Sergi I define the state of intense spontaneous attention to be a differentiation of perception producing greater psychic energy in some of the nerve centers, and a sort of temporary catalepsy in other centers.† But I have not to study attention in itself, only to determine its origin, its cause.

Plainly in the states above enumerated and in their analogues, the true cause is an affective state, a feeling of pleasure, love, hate, curiosity: in short a state more or less complex, agreeable, disagreeable or mixed. Because the prey, the spectacle, the thought of the victim, the problem to be solved produce in the animal, the child, the assassin, the mathematician, an emotion that is intense and sufficiently durable, they are attentive. Eliminate emotion, and all is gone: but while emotion lasts, so does attention. The *modus operandi* is as in those reflex actions which seem to be continuous, because an excitation that is incessantly repeated and which is ever the same keeps them up till nervous exhaustion is produced.

Is a counter proof required? Observe the incapacity for protracted attention of children, women, and in general those of inferior mental force. The reason is that objects awaken in them only superficial, instable feelings, and they are quite inattentive to high, complex, profound questions, for these do not touch their emotions. On the other hand they are attentive to trifles, for these interest them. I might add that the orator and the writer hold the attention of their public by addressing their feelings. Look at the matter from whatever side, and the same conclusion is inevitable; nor would I dwell upon so evident a fact were it not that the authors who have studied the subject of attention seem to have forgotten this all-important influence.

Spontaneous attention gives a maximum effect with a minimum of effort, while voluntary attention gives a minimum effect with a maximum of effort, and the contrast between the two is sharper in proportion as the one is more spontaneous and the other more voluntary. Voluntary attention in its highest degree is an artificial state in which with the aid of factitious emotion we keep up certain states of consciousness that are ever tending to die out—for instance when for politeness' sake we carry on a wearisome conversation. In the case of spontaneous attention it is our own individuality that produces this specialization of consciousness; in voluntary attention it is an exceedingly limited portion of our individuality. Many questions suggest themselves here, but as I have already said, I have only to study attention in itself. I had simply to show—and this point I hope is beyond controversy—that attention is by its origin of the nature of reflex action; that under the form of spontaneous attention it possesses the regularity of the reflex actions and their potency of action; but that in both cases it is a sensitive excitation that causes it, keeps it up, and measures its intensity.

Again we see that the voluntary rests upon the involuntary and derives from it all its force, and that, compared with the latter, it is very precarious. Education of the power of attention consists in the last resort simply in calling out and developing these factitious emotions, and in striving to make them stable by repetition; but as there is no creation *ex nihilo*, they must have some basis however weak in nature. To conclude as regards this point, I confess that for my part I accept the paradox

* Of course we speak of poets and mathematicians that are such by nature, not by education.

† Sergi, "Teoria Fisiologica della Percezione." See also Lewes, "Problems of Life and Mind," Third Series; Maudsley, "Physiology of Mind;" Wundt, "Grundzüge der Physiologischen Psychologie;" Ferrier, "The Functions of the Brain."

of Helvetius so often disputed, that "all intellectual differences between one man and another spring only from attention," with the proviso that attention here be taken to mean spontaneous attention alone: but then the dictum amounts only to this, that the differences between men are innate and natural.

Having shown how attention is produced, we have next to inquire how it is kept up. The difficulty is with voluntary attention only, for, as we have seen, spontaneous attention explains itself. It is continuous because the excitation which causes it is continuous. On the other hand, the more voluntary it is, the more effort does attention require, and the more instable is it. The two cases are in effect a struggle between states of consciousness. In the first case (spontaneous attention) a state of consciousness—or rather a group of states of consciousness—possesses such intensity that no struggle against it is possible, and it assumes the mastery by sheer force. In the second case (voluntary attention) the group of states of consciousness is not of sufficient intensity to dominate competing states, and it gets the upper hand only by the aid of an additional force, namely, by the intervention of the will.

By what mechanism does attention act? Apparently by an inhibition of movements. Thus we are brought back to the problem of inhibition, more involved in obscurity here than anywhere else. Let us see what is to be learned upon this point. In the first place it is hardly necessary to repeat that the brain is a motor organ, that is to say that many of its elements have for their function to produce motion, and that there is hardly a single state of consciousness which does not contain in some degree motor elements. It follows that every state of attention implies the existence of these elements. "In movements of the limbs and trunk the feelings of operation are very conspicuous; they are less so in the delicate adjustments of the eye, ear, etc., and are only inductively recognizable in the still more delicate adjustments of attention and comprehension, which are also acts of the mind in more than a metaphorical sense. . . . The purest intellectual combinations involve motor impulses (feelings of operation) quite as necessarily as the combination of muscles in manipulation. The feelings of effort and relief in seeking and finding our way through an obscure and tangled mass of ideas—the tentatives of hypothesis and induction—are but fainter forms of the feelings in seeking and finding our way along a dark road or thick forest, checked by failure and enlightened by every successful step."*

Again every state of consciousness, particularly when it is highly intense, tends to pass into movements; and so soon as it enters its motor phase, it loses its intensity, it is in decline, it tends to disappear out of the consciousness. But a state of consciousness has another way of expending itself: it may transmit its tension to other states through the mechanism of association—an expenditure inward, if you please, in lieu of an expenditure outward. But association does not proceed in one fashion only. In spontaneous attention certain associations gain the mastery themselves alone, and by themselves alone, in virtue of their own intensity. In voluntary attention—of which reflection is the highest form—we are conscious of a radiation in different directions; and in cases where we have much difficulty in being attentive, the associations which have the upper hand are those which we do not wish, that is to say those which are not chosen, not affirmed as the ones that ought to be kept up.

By what means then are the weaker associations maintained? In order to get as clear an idea as may be of the process, let us consider some analogous phenomena, though of a less abstruse kind. A man is learning to play a musical instrument, or to handle a tool, or better still, a child is learning to write. At first he makes many movements that are quite useless: he keeps moving his tongue, his head, his legs, and only by degrees does he learn to hold his members in subjection, and to confine himself to the required movements of the hands and the eyes.

In voluntary attention the process is similar. The associations which go out in all directions may be likened to these useless motions. The problem in both cases is to substitute a limited for an unlimited association. For this purpose, we eliminate all associations not helpful to the end we have in view. Properly speaking, we do not suppress states of consciousness, but we do prevent their surviving to call forth like states and to increase and multiply at pleasure. As every one knows the attempt to do this often fails and is always laborious, and while we check divagation, the available nerve force is economized to our advantage, for

* G. H. Lewes, "Problems of Life and Mind," 3d Series cont'd, page 397.

to lessen purposeless diffusion is to increase useful concentration.

Such is the idea we may form of this obscure phenomenon when we strive to get at its mechanism, instead of having recourse to any supposed "faculty" of attention, which explains nothing. Still we must admit with Ferrier that "on what physiological basis this psychological faculty rests is an extremely difficult question, and is one scarcely capable of experimental determination."* We would add that the foregoing remarks do not pretend to be an explication, but only an approximation.

CHAPTER V.

THE REALM OF CAPRICE.

To will is to choose in order to act: such is for us the formula of normal will. The anomalies so far considered may be classed in two great groups: in one impulsion is absent, and no tendency to act appears (aboulia); in the other a too rapid or too intense impulsion prevents the act of choice. Before we consider instances of extinction of the will, where there is neither choice nor acts, let us study a type of character in which either the will is not formed at all or at best exists only in an extremely instable and inefficient form. The best instance of this is seen in the hysterical constitution. Properly speaking we find here rather a constitutional state than a mere derangement. A simple irresistible impulse is like an acute disease; permanent and invincible impulses are like a chronic malady; but the hysterical character is a diathesis. It is a state in which the conditions of volition are nearly always lacking. From the description recently given by Dr. Huchard of the characters of hysterical subjects I take the following particulars bearing upon our subject:

"One prominent trait of their character is mobility. From day to day, from hour to hour, from minute to minute they pass with incredible rapidity from joy to sadness, from laughter to tears. Changeable, freakish or capricious, at one moment they talk with amazing loquacity, but the next they are gloomy and taciturn, have not a word to say, being lost in reverie or plunged in profound depression. Then they are possessed by a vague indefinable feeling of sadness accompanied by a choking sensation and oppression in the epigastric region. They have fits of sobbing, and seek to hide their tears in solitude; again on the other hand they have outbursts of immoderate laughter, without sufficient cause. 'They behave,' says Ch. Richet, 'like children who oftentimes can be made to laugh heartily, while their cheeks are still wet with the tears they have shed.'

"Their character changes like the views of a kaleidoscope, a fact which led Sydenham justly to remark that inconstancy is their most constant trait. Yesterday they were joyous, amiable, gracious: to-day they are ill-humored, touchy, irascible, vexed by every trifle, testy and snappish, dissatisfied with everything; nothing interests them, they are tired of life. They conceive a strong antipathy to-day toward the person they esteemed and loved yesterday, or *vice versa*, and they are as zealous to hate certain persons now as before they were eager to show them every mark of affection.

"Sometimes their sensibility is aroused by a most trivial cause, while the profounder emotions scarcely touch it: they are indifferent, unmoved by the recital of a real sorrow, while they shed abundant tears and give themselves up to despair on account of some harmless speech that they misinterpret, or some trivial pleasantry that they transform into an affront. This *moral ataxy* is exhibited even with regard to their nearest interests. One hysterical subject will be entirely indifferent about the conduct of her husband; another will be heedless of the danger that threatens her fortunes. By turns they are gentle or violent, says Moreau of Tours, kind or cruel; impressionable to excess; rarely master of the first movement of passion; incapable of resisting impulses of the most opposite kinds; they show a lack of equilibrium between the higher moral faculties—will, conscience,—and the lower faculties—instincts, passions and desires.

"This extreme mobility in their state of mind and their affectional disposition, this instability of character, this want of fixedness, this absence of stability in their ideas and volitions, explains their incapacity to keep the attention long fixed upon a book, a study or a task of any kind whatever.

"All these changes take place with great rapidity. In hysterical subjects the impulsions are not altogether free from control by the intelligence, as they are in epileptics, but they are quickly followed by acts. This is the explanation of those sudden movements of anger and indignation, those outbursts of enthusiasm, those fits of desperation; the mad gayety, the sudden affectionateness or the equally sudden transports of wrath during which they stamp the floor like spoiled children, break the furniture, and so on.

"Hysterical women are governed by the passions. Nearly all the different phases of their character, of their mental state, may be summed up in these words: they know not how to will, they cannot will, they will not will. Just because their will is ever waver-

* "Functions of the Brain." The two paragraphs devoted to this question will be read with profit.

ing and tottering; because it is ever in a state of instable equilibrium; because it turns like the weather vane to the slightest gust: for all these reasons do hysterical subjects show such variableness, such inconstancy in their desires, their ideas and their affections." *

Having reproduced this faithful portrait we may abridge our comments. The reader has here placed before his eyes this state of incoördination, of broken equilibrium, of anarchy and of "moral ataxy;" but it still remains for us to justify the assertion made at the beginning of this chapter, that we see here a constitutional impotence of will; that the will cannot exist here because the conditions of its existence are wanting. For clearness' sake, I will anticipate what will be established by proofs and in fuller detail when I sum up the conclusions of the work.

If we take an adult person endowed with an average will, we find that his activity (that is to say his power to produce acts) is of three degrees. In the lowest degree are automatic acts, simple or composite reflex actions, habits; next above these come the acts produced by the feelings, the emotions and the passions; highest of all the acts dictated by reason. These last presuppose the other two, rest upon them and consequently depend upon them, though they give to them coördination and unity. Capricious characters, of which the hysterical character is the type, possess only the two lower forms; the third is as it were atrophied. The rational activity is by nature, the very rare exceptions apart, always the weakest. It becomes predominant only on condition that the ideas in the mind call into action certain feelings that are far more apt than ideas to pass into acts. As we have seen, the more abstract an idea, the weaker is its motor tendency. In subjects of hysteria the regulative ideas either do not come into being at all, or they remain simply theoretic concepts. It is because certain ideas, as those of utility, convenience, duty and the like remain in this state of theoretic conceptions, that they are not *felt* by the individual, that they produce in him no affectional reverberation, so to speak, that they do not enter into his moral fiber but remain as it were a foreign element: hence they are without action; hence they are practically as though they did not exist.

The individual's power of acting is maimed and imperfect. The tendency of the feelings and passions to pass into acts is doubly strong, both in itself and because there is nothing above it to hamper it or to be a counterpoise to it. And as it is the characteristic of the feelings as of the reflex actions to go straight to their object, and to have an adaptation in one direction only—unilateral, whereas rational adaptation is multilateral,—the desires, rapidly conceived and immediately satisfied, leave the ground free for other desires whether like or opposite, according to the ever changing whims of the individual. There is nothing but caprice, or at most velleity, the merest simulacrum of volition.

Still the fact that desire proceeds only in one direction and tends to expend itself unchecked, does not explain the instability of the hysteric character nor its lack of will. If a desire that is ever satisfied is ever recurring, there is stability. The predominance of the affectional life does not of necessity preclude will: indeed a passion intense, stable, consented to is the very basis of an energetic will. Such passion we find in men of great ambition —in the martyr whose faith is not to be shaken; in the redskin who in the midst of his tortures defies his enemies. We must search deeper therefore for the cause of the instability found in the hysteric character; and this cause cannot be anything else but a state of the individuality, that is, in the last resort, of the organism. We say that will is strong whose aim, whatever it be, is fixed. If circumstances change, means are changed: adaptations are successively made, in view of new environments; but the center toward which all converges does not change. Its stability expresses the permanency of character in the individual. If the same end is ever chosen, approved, the reason is that the individual continues to be the same. But suppose an organism with instable functions, whose unity—which is simply a *consensus*—is ever in process of dissolution and reconstitution upon a new plan according to the sudden variations of the functions that make it up: clearly in such a case choice can hardly exist and cannot be enduring: there are only velleities and caprices. This is what takes place in subjects of hysteria. The instability is a fact: its cause is very probably to be found in functional disorders. Anæsthesia of the special senses or of the general sensibility, hyperæsthesia, derangement of the motor apparatus, contraction of muscles, convul-

* Axenfeld et Huchard, "Traité des Nevroses," 2d edition, 1883, pp. 958–971.

sions, paralysis, derangement of the vaso-motor, secretory and other functions—all of these causes occurring successively or simultaneously, keep the organism constantly in a state of instable equilibrium; and the character, which is only the psychic expression of the organism, varies in the same degree. For a stable character to rest upon so wavering a base were a miracle. Here therefore we see the true cause of the impotence of will, and this impotence is, as we have said, constitutional.

Certain facts, while they seem to conflict with this theory, only give confirmation to it. Hysterical patients are sometimes possessed by a *fixed* idea, of which it is impossible to disabuse them. One refuses to eat, another to speak, a third to use her eyes, on the ground that the work of digestion or the exercise of the vocal or the visual organs would, as they imagine, cause them pain. More frequently we find the species of paralysis known as "psychic" or "ideal." The patient remains abed for weeks, months or even years, in the belief that she is unable to stand or to walk. Some moral shock, or simply the influence of some one who possesses her confidence, or who acts with authority effects a cure. One betakes herself to her feet at the alarm of fire; another rises from her bed and goes to meet her long-absent brother; a third decides to partake of food out of fear of her physician. Briquet, in his "Traité de l'Hystérie," mentions several cases of women whom he cured by inspiring them with faith in their recovery. We might quote many of those so-called miraculous cures which have amused the curiosity of the public from the time of the deacon Pâris to our own day.

The physiological causes of this sort of paralysis are subject of keen disputation. Looking at it from the psychological point of view, we recognize the existence of a fixed idea the result of which is an inhibition. Now since an idea does not exist of itself, nor without certain cerebral conditions, and since it is only a part of a psychophysiological whole—the conscious part—it must correspond to an abnormal state of the organism, of the motor centers perhaps, and thence it must have its origin. However that may be, there is no "exaltation" of the will, as some physicians have stoutly contended: on the contrary there is absence of will. We come again upon a morbid type that we have already studied, differing from that only in form: it is inhibitory. But there is no reaction springing direct from the individual, against the fixed idea. It is an influence from without that interposes and produces an opposite state of consciousness, with the concomitant feelings and physiological states. The result of this is a strong impulsion to act, which suppresses and takes the place of the state of inhibition: but it is hardly a volition: at best it is a volition produced with the assistance of others.

The conclusion to which we are led by these phenomena is, again, that the conditions of will are wanting, and will cannot exist.

CHAPTER VI.

EXTINCTION OF THE WILL.

THE cases of extinction of the will, which we are now to study, are those in which there is neither choice nor action. When the whole psychic activity is, or seems to be completely suspended, as in deep sleep, in artificial anæsthesia, in coma and similar states, there is a return to the vegetative life. Of this we will not treat: the will disappears because all psychic life disappears. We have to do here with cases where one form of mental activity continues, though there remains no possibility of choice followed by act. This extinction of the will is seen in ecstasy and in somnambulism.

Authors distinguish divers kinds of ecstasy—as mystic, morbid, physiological, cataleptic, somnambulic, and so forth. These distinctions are of no consequence here, for at bottom the mental state is the same in all the forms. Most ecstasists reach the ecstatic condition naturally, in virtue of their physical constitution; but others assist nature by artificial processes. The religious and philosophical literature of the Orient, India particularly, abounds in writings from which it has been possible to compile a sort of working manual showing how to bring about ecstasy. To stand motionless; to gaze fixedly at the sky, or a luminous object, on the tip of the nose, or on one's navel (after the manner of the monks of Mt. Athos hence called *Omphalopsychi*); to repeat continually the monosyllable OM (Brahm) contemplating the while the supreme being; to "hold in the breath," *i.e.* to retard respiration; "to have no heed of time or place:" such are the acts which "cause one to be like

unto the placid light of a lamp set in a place where the wind blows not." *

Having attained this state the ecstasist presents certain physical characters: now he is motionless and mute; anon he interprets the vision that holds him entranced, by speech and song and gesture. Seldom does he quit the spot where he stands. His physiognomy is expressive, but his eyes though open see not. Sounds no longer reach his sense, save in some cases the voice of a particular person. The general sensibility is gone: he feels no contact: neither pricking nor burning causes pain.

What he feels inwardly the ecstasist alone may tell, and were it not that at waking he retains a very distinct recollection of it, the profane would have to rely on inductions. The speeches and the writings of ecstasists show striking uniformity amid differences of race, of belief, of mental constitution, of time and of place. Their mental state is reduced to one image-idea standing either isolated or as the center of a single group which engrosses the entire consciousness and maintains itself there with extreme intensity. Many mystics have described this state with great precision, and above all St. Theresa. I take a few passages from her autobiography in order thus to place before the reader an authentic description of ecstasy.

In communion with God there are four degrees of "prayer," which she compares to four ways of watering a garden, "the first by drawing the water by main force out of a well: this is sheer hard work; the second, by drawing it by means of a *noria* (Persian wheel)—in this way one obtains more water with less fatigue; the third, by conducting the water from some river or brook; the fourth and incomparably the easiest is an abundant fall of rain, God himself undertaking to water the garden without the slightest fatigue on our part."

In the first two degrees there are as yet only the rudiments of ecstasy, as she observes in passing: "Sometimes while reading I would suddenly experience a sense of the presence of God. It is utterly impossible for me to doubt that he was within me or that I was quite lost in him. This was not a Vision. . . It suspends the soul in such a way that it seems to be quite outside of itself. The will loves, the memory to me appears almost lost, the understanding acts not at all, yet it is not lost." In a higher degree which is "neither a ravishment nor a spiritual sleep," "the will alone acts and, not knowing how it is made captive, gives simply to God its consent, that he may imprison it, in the assurance that it becomes the thrall of him whom it loves. . . . The understanding and memory come to the assistance of the will, to the end it may become more and more capable of enjoying so great a good. Sometimes however their aid serves only to disturb the will, in this close union with God. But then the will, not suffering itself to be disturbed by their importunity, must cleave to the delights and to the profound calm which it is enjoying. The attempt to exercise these other two powers [faculties] would lead the will astray with them. They are then like doves which, dissatisfied with the food provided for them by their master without any exertion on their part, go in search of other food, but which, after seeking in vain, make haste to return to the dove-cote." In this degree "I look on it as a great advantage, when writing, to find myself in the prayer of which I am speaking, for I then see clearly that neither the expression nor the thought comes from me; and after it has been written, I cannot understand how I could ever have done it: this happens to me often."

In the third degree we have the ecstasy:

"This state is a sleep of the powers [faculties] wherein, though not altogether lost in God, they nevertheless know not how they operate. . . . It is as though one who longs for death were already holding in his hand the blessed candle, and had but to draw one breath more to attain the fulfillment of his longings. It is for the soul an agony full of inexpressible delights, wherein it feels itself dying almost entirely to all the things of the world, and reposes with rapture in the enjoyment of its God. No other terms do I find to portray or to explain what I experience. In this state the soul knows not what to do: knows not whether it is speaking or is silent: whether it laughs or weeps: it is a glorious delirium, a heavenly madness, a supremely delicious mode of enjoyment. . . . And while it

* "Bhagavad Gita," VI. The Buddhist teachers say that there are four degrees in the contemplation which leads to the earthly *nirvâna*. The first degree is the inward feeling of happiness which springs up in the soul of the ascetic when he declares himself to have at length come to distinguish the nature of things. The *yoghi* is then detached from all other desire save the *nirvâna*: he still exercises judgment and reason; his intelligence is all centered on the *nirvâna*, and feels only the pleasure of inner satisfaction, without judging of it, without even understanding it.

In the third degree, the pleasure of satisfaction is gone, and the sage is indifferent about the felicity which his intelligence still experiences. The sole pleasure that remains for him is a vague sense of physical well-being, obscure and all as it is; he has also lost all memory; he has lost even the sense of his indifference. Free of all pleasure and of all pain, he has attained impassibility: he is as near to *nirvâna* as he can be in this life. (Barth. Saint-Hilaire, "Le Bouddha et sa Religion," pp. 136, 137.)

thus searches for its God, the soul feels with a very lively and a very sweet pleasure that it is fainting almost quite away: it falls into a sort of swoon which little by little deprives the body of respiration and of all its strength. It is unable without a very laborious effort to make the slightest movement of the hands. The eyes close without any purpose of the soul to shut them; and if it keeps them open it sees almost nothing. It is incapable of reading, even if it would; it sees indeed the letters, but can neither distinguish them nor assemble them. When spoken to it hears the sound of the speaker's voice, but no distinct words. So too it receives no service of its senses. . . . All its outer strength departs: conscious that thereby its own strength is increased, it can the better enjoy its glorious privilege. . . . In truth, if I am to judge from my own experience, this 'prayer' is at first of so brief duration as not to reveal itself in so manifest a way by external signs and the suspension of the senses. It is to be observed, at least in my opinion, that this suspension of all the powers never lasts long: the suspension is a protracted one that lasts half an hour, and I do not think with me it ever lasted so long. Still it must be confessed that it is difficult to judge of this matter, seeing that one is at the time deprived of feeling. I would simply call attention to one point, namely that whenever this general suspension occurs hardly any time elapses before some one or other of the powers [faculties] comes to itself. The will is the faculty which persists best in the divine union, but the other two soon begin to importune it. As it is in serenity, it brings them back and suspends them again; thus they remain tranquil for a moment, and then resume their natural life. With these alternations the prayer may continue and does in fact continue for some hours. . . . But that state of perfect ecstasy in which the imagination does not wander to any external object is, I repeat, of short duration. I would add that as the powers come to themselves only imperfectly, they may remain in a sort of delirium for some hours, during which God from time to time enraptures them anew and fixes them in himself. . . . What occurs in this secret union is so hidden that it is impossible to speak of it more clearly. The soul then sees itself to be so near to God, and so strong is its certitude touching that fact, that it cannot have the slightest doubt that it enjoys such a favor, all its powers lose their natural activity: they have no knowledge of their operations. . . . Thus the butterfly, memory, sees its wings scorched here, and it no longer can flit hither and thither. The will no doubt is occupied with loving, but it understands not how it loves. As for the understanding, if it understands at all it does so in a way that remains unknown to itself, nor can it comprehend aught of what it understands."*

* "Vie de Sainte Thérèse écrite pur elle-même." Compare Plotinus, "Enneades," VI.; Tauler, "Institutio Christiana."

I will not follow St. Theresa in her description of "rapture"—"that divine eagle which with sudden impetuosity seizes you and carries you off." These extracts suffice, and whoever reads them attentively will not hesitate to attribute to them all the value of a good psychological observation.*

On examining the detailed narratives of other ecstasists, which I cannot present here, I find that ecstasy may be conveniently for the purpose of our work divided into two classes. In the first motor power persists in a certain degree. The ecstasist follows the several phases of the Passion, the Nativity or some other religious drama, reproducing it with appropriate movements. There is a series of highly intense images with one invariable order of succession, being repeated again and again with perfect automatism. Marie von Moerl and Louise Lateau are well known instances.

The other class is that of ecstasy in repose. Here the idea alone reigns, commonly an abstract or metaphysical idea: in the case of St. Theresa and Plotinus it is the idea of God; for Buddhists it is *Nirvâna*. All movements are repressed: there is felt only "a residuum of inward agitation." Observe in passing how all this agrees with what has already been said, that with abstract ideas the tendency to movement is at the minimum, and that these ideas being representations of representations—pure schematisms—the motor element grows weaker in the same degree as the representative element.

But in both cases the mental state of ecstasy is a complete reversal of the laws of the normal mechanism of consciousness. Consciousness exists only on the condition of perpetual change: it is essentially discontinuous. An homogeneous and continuous consciousness is an impossibility. Ecstasy fulfills the conditions of

* St. Theresa thus describes her physical state during her "raptures": "Oftentimes my body would become so light that it no longer possessed any weight—sometimes I no longer felt my feet touching the ground. While the body is in rapture it remains as though it were dead, and often is absolutely powerless to act. It retains whatever attitude it may have assumed at the moment of the access; thus it continues standing or seated, the hands open or closed, in a word it continues in the state wherein the rapture found it. Though commonly a person does not lose feeling, still it has happened to me to be entirely deprived of it. This has occurred very rarely and it has lasted only for a very short time. Most frequently feeling remains; but a person experiences an indefinable disturbance; and though it is impossible to perform any external act, one still can hear a sort of confused sounds coming from a distance. And even this kind of hearing ceases when the rapture is in the highest degree."

such consciousness in the highest degree possible, but as St. Theresa remarks, either consciousness disappears, or the understanding and the memory—that is discontinuity—come back at intervals bringing consciousness back with them.

This psychological anomaly is complicated with another. All states of consciousness tend to expend themselves in proportion to their intensity. In the highest ecstasy the expenditure is naught, and it is owing to the absence of the motor phase that the intellectual intensity is maintained. The brain, which is in the normal state an organ at once intellective and motor, ceases to be a motor organ. Furthermore, in the intellectual order the heterogeneous and manifold states of consciousness which constitute the ordinary staple of life have disappeared. The sensations are suppressed, and with them the associations they call out. One single representation absorbs everything. If we compare the normal psychic activity to circulating capital that is continually modified by receipts and outlays, then we may say that here the capital is massed in one sum; concentration takes the place of diffusion, extensive force is transformed into intensive. It is no wonder therefore if in this state of mental erethism the ecstasist seems to be transfigured, lifted above herself. Certainly the visions of the rude peasant girl of Sanderet who saw a virgin all of gold in a silvery paradise, bear but little resemblance to those of a Saint Theresa; but every intelligence does its maximum in the moment of ecstasy.

Is there any need now of inquiring why there is neither choice nor acts in that state? How could there be choice, seeing that choice presupposes the existence of that complex whole, the Ego, which has disappeared? The personality being reduced to one idea or one vision, there is no state that can be chosen, that is incorporated with the whole, to the exclusion of others. In a word there is nothing that can choose, nothing that can be chosen. As well might we suppose an election without either electors or candidates.

Thus action is nipped in the bud, utterly estopped. Only its elementary forms remain, as the respiratory movements, etc., without which organic life were impossible. We have here a curious instance of psychological correlation or antagonism: whatever one function gains is lost by some other: whatever thought gains is lost by movement. In this respect ecstasy is the opposite of the states in which motility is predominant, as epilepsy, chorea, convulsions, etc. In these cases we see maximum of movements, minimum of consciousness: in ecstasy intensity of consciousness with minimum of movement. There is at all times only a certain sum of nervous and psychic force available: if this is monopolized by one function, the other functions are impoverished. Whether the excess shall be on the one side or on the other depends on the nature of the individual.

Having studied extinction of the will in its highest phase, we may remark that we find in the act of contemplation, of profound reflection, modified and minor forms of the same phenomenon. The unfitness of contemplative minds for action has its physiological and psychological reasons, and these are explained to us by the state of ecstasy.

It is of equal interest to the psychologist and to the physiologist to know what it is that produces abolition of consciousness in somnambulism whether natural or artificially induced, and from what organic conditions it results. But though the subject has been a matter of eager research for some years, we have nothing to offer but theories, and the reader may choose between several hypotheses. Some authors, as Schneider and Berger, regard it as a result of "expectant attention" producing a unilateral and abnormal concentration of consciousness. Preyer holds it to be a special case coming under his theory of sleep. Other authors, as Rumpf, favor the theory of reflex changes in the cerebral circulation—hyperæmia and anæmia in the surface of the hemispheres of the brain. Heidenhain who opposes this last theory refers hypnotism to an inhibiting action. There occurs, he says, a suspension of the activity of the cortical nerve cells, probably resulting from a change in their molecular arrangement, and in this way the functional movement of the gray matter is interrupted. This hypothesis seems to be most in favor, and since it is, at least from the psychological standpoint, simply a statement of fact, we may adopt it.

There is no need to describe a state so many times described before, and that so carefully. We would merely remark that the terms somnambulism, hypnotism and their analogues do not designate a state identical in all individuals and in every case. This state varies in the same individual from simple drowsiness to profound stupor; between one individual and

another it varies according to their respective constitutions, pathological conditions, etc. It would therefore be illogical to affirm that there is always abolition of the will power. As we shall see, some cases are very doubtful.

Take first hypnotism in the form designated by many authors Lethargic. The mental inertia here is absolute; consciousness is utterly gone; the reflex actions are in excess—an excess which always keeps pace with the decline of the higher activity. At a word from the operator, the hypnotized subject rises, walks, sits down, sees absent persons, goes on a journey, describes the landscape, and so on. The only will, as we say, is that of the operator. The meaning of this expressed in more precise terms, is: In the vacant field of consciousness a state is called up; and since states of consciousness tend to action, whether immediately or after having called forth associations, an act follows. The passage to action is here all the easier because there is nothing that hinders it, neither power of inhibition nor an antagonistic state, the idea suggested by the operator having the sole dominion in the slumbering consciousness. Other phenomena apparently more anomalous are explained in the same way. We know that by giving to the members of the hypnotized subject certain postures we can awaken in him the emotion of pride, terror, lowliness, devotion, etc.; if we place him in the position for climbing, he makes as though he were going up a ladder; if we put in his hands any instrument he has been wont to employ, he goes to work with it. Plainly the position given to the members awakens in the cerebral centers the corresponding states of consciousness with which they have become associated by much repetition. The idea, once it is awakened, is in the same condition as one coming from the direct order or suggestion of the operator. All these cases therefore are reducible to the same formula: the hypnotized subject is an automaton that is made to act according to the nature of his organization. There is absolute abolition of will, the conscious personality being reduced to one single state which is neither chosen nor rejected, but suffered, imposed.

The automatism is spontaneous in natural somnambulism; in other words, it has for its antecedent some cerebral state, and that in turn has for its antecedent some special excitation in the organism. Often the automatism is of a high order: the series of states of consciousness called out is long and each term of the series is complex. As its type we may cite the singer whose history is given by Mesnet. If a cane were offered to him he would take it to be a musket, his recollections of army life coming back to him; he would load his weapon, lie prone upon the ground, take aim and fire. Give him a roll of paper, and his recollection of his present calling were called forth; he would open the roll and sing at the top of his voice.* But the unvarying repetition of the same acts in the same order in each paroxysm gives to all these phenomena a very definite character of automatism from which all will power is eliminated.

Some cases however are doubtful. Burdach tells of "a very fine ode" that was composed in the somnambulic state. The story has often been told of the abbé who in preparing a sermon corrected and pruned his sentences, changed the places of epithets, etc. Again, a man made sundry attempts at suicide and each time tried different means. Facts of this kind are so numerous that, even making allowance for credulity and exaggeration, it is impossible to reject them all.

It might be said that such acts involve comparison followed by a choice, a preference—in other words a volition: and hence that we have here will power, that is a true reaction of the individual, faint, indeed, obscure, limited, but active.

But we may also hold that automatism is of itself sufficient. For is it not a recognized truth that in the normal state the intellectual work is often automatic, and all the more valuable on that account? Is not what the poets call inspiration an involuntary and almost unconscious sort of brain work—at least is it not conscious only in its results? We read our own writings over again, and our corrections are often spontaneous, that is to say, the movement of thought brings a new association of words and ideas which is immediately substituted for the other. Hence it may be that the individual as one that chooses and prefers is here of no account. Examining the matter more minutely, we may hold that all these cases are not strictly comparable: if to compose an ode automatism suffices, it does not suffice for correcting it; in the latter case there is choice, however rapid, however insignificant we may suppose it to be. Instead of a zero of will we should have a minimum of will. This opinion is reduci-

* "De l'Automatisme de la Mémoire et du Souvenir dans le Somnambulisme Pathologique." Paris, 1874.

ble to the first, and differs from it only by a hair's breadth.

The reader will choose between these two interpretations. I pass now to cases in which the data are more definitely ascertained. We find among hypnotized subjects instances of *resistance*. An order is not obeyed, a suggestion is not followed immediately. The mesmerists of the last century recommended the operator to assume the tone of authority and advised the subject to practice trust, confidence, which produce assent and prevent resistance.

"While in the state of somnambulism B. performed certain acts at the word of command, but others she refused to perform. Usually she would not read though we are confident she could see, despite the apparent occlusion of her eyelids. When her hands were placed in the attitude of prayer, her mind was impressed accordingly. Asked what she was doing, she said she was praying to the Blessed Virgin, but that she did not see her. So long as her hands remained in the same position, she continued her prayer, and *showed displeasure* if any one sought to distract her. When the position of the hands was changed, the praying ceased immediately. However exempt it may be from will action, the praying is in this case in some sort under the control of the reason, for the subject shows a dislike to being distracted, and is able to argue with any one who would interrupt her prayer." * One of Richer's subjects readily allowed himself to be metamorphosed into an officer, a sailor, etc., but he refused with tears in his eyes to be transformed into a priest. This was sufficiently explained by the man's habits and the atmosphere in which he had lived.

Hence there are cases in which two states co-exist—one produced by outside influences, the other by influences from within. We know what the automatic power of the former is. But in the other state this is effaced by a contrary state: there is here something resembling inhibition. But the inhibition is so weak that commonly it succumbs before repeated attacks: and it is so vague that we cannot say what its nature is. Is it not simply an antagonistic state of consciousness awakened by the very suggestion, so that it would all amount to the co-existence of two contrary states of consciousness? Or is the case more complex, and must we say that it represents the sum of the tendencies still existing in the individual, and some residue of that which constitutes his character? If we accept Heidenhain's theory we must recognize in the so called lethargic state a complete arrest of functional activity; the order or the suggestion of the operator would set in action an exceedingly limited number of nerve elements in the cortex; but in the state of resistance we should see awakening from their sleep some of those elements which in the normal state constitute the physiological and psychological basis of the individuality, being the synthetic expression of the organism. It must be confessed that, even admitting this second hypothesis, all that would remain of will power, of the individual's power of reacting according to his nature, would be an embryo, a power so stripped of efficacity that it is hardly to be called will.

Again it may be remarked that if it is difficult for the observer to say what power of reacting persists in the person who resists, the person himself is no better judge. "A close analysis of the phenomena such as can be made by educated, intelligent men submitting to the action of animal magnetism, proves how difficult it is even for the magnetized patient to make sure that he is not simulating. To make these observations, the sleep should not be very profound. In the period of *engourdissement* consciousness is retained, but nevertheless there is a very plain automatism." A physician of Breslau told Heidenhain that magnetization made no impression on him; yet after he had been brought into the state of *engourdissement*, he was unable to pronounce a single word. On being awakened, he declared that he could have spoken easily enough, and that if he had said nothing, it was because he had preferred not to speak. Put in the state of *engourdissement* again by a few passes, he was again unable to speak. Once more he was awakened, and had to confess that if he had not spoken the reason was that he could not speak. A friend of mine having been *engourdi*, and not quite put to sleep, observed closely this phenomenon of impotence coincident with the illusion of the possession of power. When I indicate to him a movement to be performed, he always executes it, though before being magnetized he was quite determined to resist. This he has the greatest difficulty in accounting for after awakening. 'Certainly,' he says, 'I could resist, but I have not the will to do so.' Sometimes he is tempted to believe that

* P. Richer, "Étude sur l'Hystéro-Épilepsie," pp. 426, 427.

he is simulating. 'When I am dozing,' he says, 'I simulate automatism though I could, as it seems to me, act otherwise. I begin with the firm resolve not to simulate, but in spite of me when sleep begins it seems to me that I simulate.' Of course this sort of simulation of a phenomenon is absolutely identical with its reality. Automatism is demonstrated by the very fact that perfectly honest subjects are unable to act otherwise than as automata. It is of little consequence that they imagine that they are able to resist. *They do not resist.* That is the fact that must be taken into consideration, and not the illusion that possesses them that they have the power of resistance."*

Still this power of resistance, weak though it be, is not equal to zero: it is a last survival of the individual reaction exceedingly reduced; it is on the confine of nullity but does not pass over. The illusion of this feeble power of inhibition must answer to some equally precarious physiological state. In short the state of somnambulism whether natural or induced may justly be regarded as a state of abolition of the will. Exceptions are rare and obscure, but they bring their own measure of instruction. They prove once again that volition is not an invariable quantity, but that it diminishes till the point is reached where we may with equally good reason either affirm or deny its existence.

I will mention in passing a fact that hardly belongs to the pathology of the will but which furnishes matter for reflection. Certain hypnotized subjects may be commanded to perform an action at some future time, at a given time in the same day, or even at a later time, say eight or ten days hence. After they have come to, they execute the command at the prescribed time, on the appointed day, commonly saying that they know not why. In some curious instances these persons give specious reasons to explain their conduct, to justify this act which does not spring from their own spontaneity, but is imposed upon them though they know it not. I cite a case that came under my own observation. A young man at 10 o'clock ordered his mistress who was in the hypnotic state to leave him at three o'clock in the morning; then he restored her to the normal state. Toward three o'clock she awoke, made ready to go, and though he begged her to stay, she found reasons to excuse and justify her going at that unseasonable hour. "Our illusion of free will," says Spinoza, "is only ignorance of the motives that lead us to act." Do not facts of this kind support the dictum?*

* Ch. Richet, in the "Revue Philosophique," 1883.

CHAPTER VII.

CONCLUSION.

HAVING examined the different morbid types, let us now see whether we can discover a law which shall sum up the pathology of the will and throw some light upon the normal state.

As a matter of fact, volition alone exists, that is to say a choice followed by acts. Certain conditions are requisite to produce a volition. A lack of impulsion or of inhibition, an excess of automatic activity, of a tendency, of an appetite, a fixed idea, all these may prevent volition for a moment, an hour, a day, a period of one's life. The sum of these necessary and sufficient conditions may be called will. With respect to volition the will is a cause, though it is itself a sum of effects, a resultant varying with its elements. This has been proved by pathology.

These elements, briefly stated, are as follows: 1. Tendencies toward action (or inhibition) resulting from the circumstances, the surroundings, the counsels, the education that influence a person. In a word all tendencies which are the effect of external causes.

2. Character, the principal element, which is the effect of interior causes, and not an entity but the resultant of the innumerable infinitesimal states and tendencies of all the anatomical elements that constitute a given organism. Or briefly, character is for us the psychological expression of a given organism, deriving from it its proper complexion, its special tone and its relative permanence. It is the ultimate stratum whereon rests the possibility of will and which makes the will strong or weak, intermittent, average or extraordinary.

If now we consider the will not in its constituent elements but in the phases through which it passes in its evolution, we see that volition is the final term in a progressive series whereof simple reflex action is the first step. It is the highest form of activity—activity being understood

* Many similar facts are recorded in Ch. Richet's article already quoted, "Rev. Philos.," March, 1883.

in the precise sense of power to produce acts, power of reaction.

The will has for its basis a legacy coming down from generations innumerable, and registered in the organism, namely primordial automatic activity, which is almost invariable, and quite unconscious, although in the distant past it must have been accompanied by a rudiment of consciousness which later faded away, in proportion as coördination, growing more perfect, became organic in the species.

Upon this basis rests the conscious and individual activity of the appetites, desires, feelings, passions, whose coördination is more complex and far less stable.

Higher still we have ideomotor activity which in its extreme manifestations attains a coördination at once very stable and very complex: this is perfect volition.

It may therefore be said that perfect volition has for its coördination a *hierarchic coördination*, that is to say, it is not enough that reflex actions be coördinated with reflex actions, rational tendencies with rational tendencies, but there must be coördination between these different groups—coördination with subordination, so that all shall converge toward a single point, namely the end to be attained. Let the reader recall the morbid cases already cited, and in particular those irresistible impulses which in themselves represent almost the entire pathology of the will, and he will see that they are all reducible to this formula: Absence of hierarchic coördination, independent, irregular, isolated, anarchic action.

Hence whether we regard the will in its constituent elements or in the successive phases of its genesis—and the two aspects are inseparable,—we see that its ultimate result, volition, is not a phenomenon supervening we know not whence, but that it has its root deep in the nature of the individual, nay beyond the individual in the species and in all species. It comes not from above but from below; it is a sublimation of the lower elements. Volition may be compared to the keystone of an arch. To that stone the arch owes its strength, even its existence; nevertheless this stone derives its power from the other stones that support it and press it on all sides, as it in turn presses them and gives them stability.

These preliminary observations were requisite for an understanding of the law which governs overthrow of the will; for if the foregoing considerations be just, then since dissolution always pursues a course the reverse of that followed by evolution, it follows that the more complex will manifestations must disappear before the more simple and the more simple before automatism. To express the law in its exact form, and regarding volition not as a phenomenon *sui generis* but as the highest manifestation of individual activity, we should say that dissolution proceeds in a retrograde direction from the more voluntary and the more complex to the less voluntary and the more simple, *i.e.* toward automatism. We have now to show that this law is confirmed by facts, and here we have only to select our materials.

In 1868 Hughlings Jackson, while engaged in the study of certain disorders of the nervous system, observed, for the first time as I believe, that the more voluntary and the more specialized movements and faculties are the first to be affected, and that in a greater degree than the others.* This "principle of dissolution," or of "reduction to a more automatic state" was proposed by Dr. Jackson as the correlative of Herbert Spencer's doctrines touching the evolution of the nervous system. He takes a very simple case, that of hemiplegia from lesion of the corpus striatum. A clot of blood here makes an experiment for us. The patient, whose face, tongue, one arm and one leg are paralyzed, has lost the more voluntary movements of a portion of his body, without losing the more automatic movements. The study of cases of hemiplegia, says he,† proves that the external parts which suffer most are those which psychologically speaking are most controlled by the will, and which physiologically speaking imply the greatest number of different movements, produced with the greatest number of different intervals. If the lesion be serious and if it affect not only the more voluntary parts, as face, arms, legs, but also those which are less voluntary, as when the patient loses the power of certain movements of the eyes, the head and one side of the chest, we find that the more voluntary parts are much more gravely paralyzed than the others.

So too Ferrier observes ‡ that the general destruction of the motor region in the cortex, as of the corpus striatum, produces the same relative disorder of the different movements, those movements being most

* "Clinical and Physiological Researches on the Nervous System." London, 1875.

† "Clinical and Physiological Researches on the Nervous System."

‡ "Localization of Diseases of the Brain."

affected and paralyzed which are most under the influence of the will, at least after the first shock has passed away. Facial paralysis has its seat especially in the inferior facial region, and affects the more independent movements, the frontal and the orbicular muscles being only slightly affected. The movements of the legs are less affected than those of the arm, and those of the arm less than those of the hand.

The same author draws a distinction between the different *kinds* of movements and their respective centers—those which imply consciousness (and which are called voluntary in the strict sense of the word), and those which are described as automatic, instinctive, responsive (including motor-adaptations of the equilibrium and of motor-coördination, and the instinctive expression of the emotions) which are more or less perfectly organized in the centers underlying the cortex. And he says that the latter possess a relative independence which is at its maximum in the lower vertebrates (the frog, the pigeon) and at the minimum in the monkey and in man. He thinks that in animals whose motor faculties do not seem to suffer much from destructive lesion of the nervous centers, those movements are paralyzed which imply consciousness (voluntary movements) and which are not automatically organized. This, he adds, is proved by the researches made by Goltz. That author has shown that though the paw of a dog is not absolutely paralyzed as an organ of locomotion by lesion of the cortex, it is absolutely paralyzed *in so far as it serves as a hand and is employed as such.* This observation is of prime importance for us, as showing that when an organ is adapted both for locomotion and prehension, the former function persists, though impaired, while the latter function, which is the more delicate one, disappears.*

The instability of the voluntary, complex, higher action as compared with the automatic, simple, lower action is seen again in a *progressive* form in general paralysis of the insane. "The earliest imperfections of the motor power," says Foville, "those which betray themselves by a beginning, and hardly a beginning even of a break in the harmony of the muscle contractions, are the more readily appreciated because they concern the more delicate movements, and those which require the greatest precision and the greatest perfection. Hence it is not surprising that the delicate muscular movements which go to produce phonation should be the first affected." It is known that an impediment of speech is one of the first symptoms of this malady. Though at first this is so slight that only a practiced ear can detect it, the defect of pronunciation increases steadily and ends at last in unintelligible babble. "The muscles which aid in articulation lose all their harmony of action; they are able to contract only with an effort; the words spoken cannot be understood. In the several members lesions of the motility at first affect only the movements that require the greatest precision. The patient can walk long distances and can use the arm in work that only calls for general movements; but he is unable to perform any of the minor and more delicate operations of the fingers without some degree of tremor, and he has to try again and again. The defect is noticed when the man is asked to pick up a pin from the ground, to wind his watch, etc. Artisans accustomed in their trade to work of great exactitude are incapacitated far more quickly than those whose tasks require but little precision. In writing the pen is held with a degree of indecision which manifests itself in the more or less irregular form of the letters. And as the disease progresses the handwriting becomes more tremulous and irregular, so that by comparing a series of letters written at different periods, we may trace the progress of the malady, till in the end the patient becomes quite unable to write.

"At a later stage the vacillation of the superior members is seen even in their general movements: owing to tremulousness and feebleness of the muscles of the arm the patient is unable to pass food to his mouth, to take out his handkerchief or to replace it in his pocket, etc.

"In the inferior members the course of the malady is much the same. At first insane general paralytics are able to walk firmly when going straight forward: but when they have to turn to the right or to the left, and above all when they have to wheel round in order to retrace their steps, they show hesitation and lack of precision in their movements. Later, even when they are walking straight forward, they

* Ferrier, "Localization," etc. From Goltz's experiments it appears that if the lesion is in the left brain, then in all movements in which the dog was wont to employ the fore paw as a *hand*, he gives up the use of the right paw. Thus he will hold a bone with the left fore paw only, and will employ only that paw in scratching the ground, or in touching his wound. If the dog has been trained to give his paw, he will, after mutilation, give only the left paw. (Goltz, in "Dict. Encycl. des Sci. Méd.," art. NERVEUX.)

advance with a heavy tread and with ill-coördinated steps. Later still they have difficulty in making even a few paces." *

Compare the disorders of the motor system which follow the abuse of alcohol. Tremor is one of the earliest phenomena. "The hands are first affected, next the arms, the legs, the tongue and the lips. As the disorder progresses the tremulousness becomes complicated with another affection of a more serious kind, muscular debility. This too first affects the superior member in nearly every case. The fingers lose their cunning, the hand holds objects imperfectly and lets them slip from its grasp. Then this feebleness extends to the forearm and to the arm. The patient now can use his superior members only in a very imperfect fashion, and in time he is unable to take his food without assistance. Later these phenomena extend to the inferior members. To stand becomes difficult; the gait is unsteady, tottering; and these symptoms become more and more pronounced from day to day. The muscles of the back in turn succumb, and the patient must keep his bed." †

Compare also what takes place in convulsions, chorea, etc. This steady advance, which for the physician possesses only a clinical interest, has for us a psychological interest. These familiar facts will suffice, I hope, to prove that the course of dissolution is from the complex to the simple, from the voluntary to the automatic, and that the final term of evolution is the initial term of dissolution. We have so far studied, it is true, only the disorganization of movements, but those who treat psychology as a natural science will find here nothing that needs to be restated. Inasmuch as volition is for us not an imperative entity reigning in a world apart, but the ultimate expression of an hierarchic coördination; and as each movement or group of movements is represented in the nerve centers, it is plain that with each group that is paralyzed an element of coördination disappears. If the dissolution is progressive, the coördination, which is continually being stripped of some element, becomes more and more restricted: and since experience shows that the disappearance of movements is in direct ratio to their complexity and their precision, our theory is justified.

We might further pursue this verification of our law by calling attention to what takes place in diseases of speech. Here we touch upon the inmost mechanism of the mind: but I will not discuss over again a subject I have already treated at length. In "The Diseases of Memory," * I have endeavored to show that many cases of aphasia result from motor amnesia, that is, from a forgetfulness of motor elements, of those movements which constitute articulate speech. I will simply repeat that it was an observation of Trousseau that "aphasia is always reducible to a loss of memory either of the vocal signs or of the means whereby words are articulated;" and that W. Ogle also recognizes two word memories —one, recognized by every one, whereby we are conscious of a word, and besides this another whereby we express it. This forgetfulness of the movements, though primarily it is a disease of memory, reveals to us furthermore an impairment of the motor power, a disordered condition of voluntary coördination. The patient wishes to express himself, but his volition comes to naught or manifests itself imperfectly; that is to say the sum of the coördinated tendencies which at the moment constitute the individual in so far as he would express himself, is partially hindered in its passage into act; and experience teaches us that this impotence of expression affects first words, *i.e.* rational speech; next exclamatory phrases, interjections, what Max Müller calls emotional language; lastly, and only in rare cases, gesture. Here too then dissolution proceeds from the more complex to the less complex and to the simple: from the voluntary to the semivoluntary and the automatic; but the latter is in most cases unaffected.

We may now advance further into the purely psychic life, but here all becomes vague and fluctuating. As we no longer can refer each volition to a group of movements of the vocal, locomotory or prehensile organs, we must needs grope. Still we cannot but perceive that the highest form of volition, voluntary attention, is rarest of all and the most instable. If instead of considering voluntary attention † after the fashion of the subjective psychologist who studies himself and there halts, we consider it in the mass of sane adult persons, in order to determine approxi-

* Foville in the "Dictionnaire de Médecine," art. PARALYSIE GÉNÉRALE.

† Fournier, *ibidem*, art. ALCOOLISME.

* See HUMBODLT LIBRARY, No. 46, Chapter III., page 39.

† We do not speak of involuntary attention, which is natural, spontaneous. This point has already been explained in Chapter IV.

mately what place it holds in their mental life, we shall see how seldom it occurs and for how short a time it lasts. If it were possible to survey humanity as a whole for a given period of time, and to compare the sum of the acts produced by voluntary attention with the sum of the acts produced without it, we should find the ratio to be nearly as zero to infinity. By reason of its very superiority and its extreme complexity, it is a state, a coördination* that can seldom come into existence and which begins to break up as soon as it is formed.

To confine ourselves to admitted facts, is it not a familiar observation that inability to hold the mind attentive is one of the first symptoms of mental impairment whether temporary as in fevers, or permanent as in insanity? The highest form of coördination therefore is the most instable, even in the purely psychological order.

And what is this law of dissolution but a phase of the great biological law already pointed out with respect to memory, viz., that the functions last to be acquired are the first to degenerate. In the individual automatic coördination precedes coördination springing from the appetites and passions; this latter precedes voluntary coördination: and the simpler forms of voluntary attention precede the more complex. In the development of species, according to the evolution theory, the lower forms of activity existed alone for ages; then with the increasing complexity of the coördinations came will. Hence a return to the reign of impulsion, with whatever brilliant qualities of mind it may be accompanied, is in itself a regression. This being so, the following passage from Herbert Spencer will serve us as a summation and a conclusion upon this point:†

"There is one other trait of nervous debility on which a few words may be said—the accompanying change of character or modification of the emotional nature.

"Even small ebbings of the nervous fluid hardly to be called abnormal produce slight modifications of this kind, as is observable in children. The highest coördinating plexuses being in them the least developed, children betray more quickly than adults any defective action of these plexuses; and they habitually do this when the general nervous pressure is below par. Sluggishness of the alimentary canal, implying partial failure of nutrition and decreased genesis of energy, is accompanied by fretfulness—by a display of the lower impulses uncontrolled by the higher.

"It is however in the chronically nervous whose blood, deteriorated in quality and feebly propelled, fails to keep up a due activity of molecular change, that we see this connection of phenomena most clearly. The irascibility of persons in this state is matter of common remark; and irascibility implies a relative inactivity of the superior feelings. It results when a sudden discharge, sent by a pain or annoyance through those plexuses which adjust the conduct to painful and annoying agencies, is unaccompanied by a discharge through those plexuses which adjust the conduct to many circumstances instead of a single circumstance. That deficient genesis of nervous fluid accounts for this loss of emotional balance is a corollary from all that has gone before. The plexuses which coördinate the defensive and destructive activities, and in which are seated the accompanying feelings of antagonism and anger, are inherited from all antecedent races of creatures, and are therefore well organized—so well organized that the child in arms shows them in action. But the plexuses which by connecting and coördinating a variety of inferior plexuses adapt the behavior to a variety of external requirements have been but recently evolved; so that besides being extensive and intricate they are formed of much less permeable channels. Hence when the nervous system is not fully charged these latest and highest structures are the first to fail. Instead of being instant to act, their actions, if appreciable at all, come too late to check the actions of subordinate structures."

Having step by step followed the course of dissolution of the will, the fundamental result seems to be that the will is a coördination varying in complexity and in degree; that this coördination is the condition of all volition; and that when the coördination is either partially or wholly broken up, volition is either abolished or maimed. Upon this result we would now insist, limiting ourselves to a few brief suggestions upon certain points.

I. Let us first examine the material conditions of this coördination. Will, though among a privileged few it attains extraordinary power and performs great feats, has a very lowly origin. It has its rise in a biological property inherent in all living matter and known as irritability, that is to say reaction against external forces. Irritability—the physiological form of the law of inertia—is in some sense a state of primordial indifferentiation whence shall spring, by an ulterior differentiation, sensibility properly so called and motility, those two great bases of psychic life.

* Just as groups of simple movements have to be organized and coördinated to allow of the higher coördination from which come delicate and complex movements; so must groups of simple states of consciousness be organized, associated and coördinated to allow of this higher coördination called attention.

† "Principles of Psychology," vol. i., § 262.

Motility, which alone concerns us here, manifests itself even in the vegetal kingdom under divers forms, as by the movements of certain spores, of the Sensitive Plant, of *Dionæa* and sundry other plants to which Darwin has devoted a well known work. The apparently homogeneous protoplasmic mass which alone constitutes certain rudimentary organisms, is possessed of motility. The amœba, the *white* corpuscle of the blood, move little by little by the aid of the processes which they send out. These facts which are described in many special works teach us that motility made its appearance long before the muscles and the nervous system.

We have no occasion to follow the evolution of these two apparatus through the animal series. We would only remark that researches upon the localization of the motor centers—a subject that very nearly concerns the mechanism of the will—have led some physiologists to study the state of these centers in new-born animals. "This investigation, very carefully made by Soltmann in 1875, gave the following results: In hares and dogs, there does not exist, immediately after birth, any point in the cortex capable, under electric irritation, of producing movements. Not until the tenth day are the centers for the anterior members developed. On the thirteenth day the centers for the posterior members appear. On the sixteenth these centers are distinguishable from one another and from those belonging to the face. One conclusion to be drawn from these results is that the absence of voluntary motor direction coincides with the absence of the corresponding organs, and that the more the animal becomes master of its movements, the cerebral centers in which the volitional process takes place gain a more manifest independence."*

Flechsig and Parrot have studied the development of the brain in the fœtus and in the infant. From the researches of the latter author† it appears that if we follow the development of the white matter of an entire hemisphere, we find it rising successively from the peduncle to the optic thalami, then to the internal capsule, to the hemispheric center, and finally to the mantle of the brain. The parts which are slowest to develop are those which are destined to perform the highest functions.

The formative period past, the mechanism of will action seems to be as follows: The incitation starts from the so called motor regions of the cortex (parietofrontal region) and follows the pyramidal fasciculus called by some authors the voluntary fasciculus. This fasciculus which is formed by the grouping of all the fibers coming from the motor convolutions, descends through the oval center, and forms a small part of the internal capsule, which as we know penetrates into the corpus striatum "like a wedge into a piece of timber." Then it follows the peduncle and the medulla where it undergoes more or less perfect decussation and passes to the opposite side of the cord, so forming a great commissure between the motor convolutions and the gray matter of the cord, from which are given out the motor nerves. This rough sketch gives some notion of the complexity of the elements requisite for will action, and of the close connection which exists between them.*

Unfortunately there are differences as to the interpretation of the real nature of the brain centers from which comes the incitation. According to Ferrier and many other authors these are motor centers in the strict sense, that is to say, in them and through them the movement begins. Schiff, Hitzig, Nothnagel, Charlton Bastian and Munk have given other interpretations not all of equal clearness or of equal probability. But they generally agree in regarding these centers as being rather "sensory" in their nature, the motor function proper being referred to the corpus striatum. "The nervous fibers that extend from the cerebral cortex, in higher animals and in man, down to the corpora striata are in their nature strictly comparable with the fibers connecting the 'sensory' and the 'motor' cells in an ordinary nervous

* François-Franck, in the "Dictionnaire Encycl. des Sci. Méd.," art. NERVEUX, p. 585.
† "Archives de Physiologie," 1879.

* The process is described as follows by Dr. Charlton Bastian. Taking the spinal and medullary mechanisms as being either developed or in process of development we may now turn our attention more particularly to a consideration of the parts whence and of the channels through which cerebral incitations pass in emotional, ideomotor and volitional movements. One part of the route has been pretty clearly defined.

Motor stimuli pass from certain parts of the cerebral cortex downward to the corresponding corpora striata. These bodies are called into activity in a way which cannot be defined, though from them the motor stimuli seem to be continued and redirected toward the motor mechanisms in the medulla and spinal cord. The tracks of these latter stimuli are fairly well known. They pass from each corpus striatum through the inferior layers of the crus cerebri and through the pons Varolii on the same side; while below this bridge they are gathered together in the anterior pyramid of the medulla, which after a course of a little more than an inch decussates in part with its fellow, so that many of the fibers of each pyramid pass over into the opposite lateral column of the cord, while some continue to descend on the same side in the anterior column.—"The Brain as an Organ of Mind," chap. xxvi.

mechanism for reflex action."* In other words, there exists in the cortex "circumscribed regions experimental excitation of which produces in the opposite side of the body determinate localized movements. Seemingly these points ought to be regarded much rather as centers of voluntary association than as motor centers properly so called. They are the seat of incitements to voluntary movements, and not actual starting points of movements. They are to be compared rather to the peripheric organs of sense than to the motor apparatus of the anterior cornua of the medulla. These centers then are psychomotor centers because by their purely psychic action they command true motor apparatus. . . . We believe that the different points indicated as motor centers for the members, the face, etc., correspond to the apparatus which receive and transform into voluntary incitation the sensations of peripheric origin. These are volitional centers, not true motor centers."†

But notwithstanding this question remains still undecided, and notwithstanding the matters of detail respecting the part played by the cerebellum that are as yet undetermined, we may say with Charlton Bastian that "if since Hume's time we have not learned in any full sense of the term 'the means by which the motion of our bodies follows upon the command of our will,' we have at least learned something as to the parts chiefly concerned, and thus as to the paths traversed by volitional stimuli."‡

II. If we look at the question on its psychological side, voluntary coördination assumes so many forms and exists in so many degrees that we can only note its principal features. It would be the natural course to consider the lowest form, but I judge it best, for the sake of clearness, to follow the reverse order.

Coördination of the most perfect kind is seen in great men of action whatever be the nature of their activity—in Cæsar, Michelangelo or Saint Vincent de Paul. Its properties are unity, stability, power. The outer unity of such men's lives is founded on the unity of their aim which they steadily pursue, and which according to circumstances makes new coördinations and adaptations. But this outer unity itself is but the expression of an inner unity —the unity of their character. It is because they remain the same that their aim is the same. What is fundamental in their nature is a mighty, irrepressible passion which controls all their thoughts. This passion is the man—the psychic expression of his constitution as nature made it. Such men present the type of a life always in harmony with itself, because in them everything conspires and converges to a definite aim. Such characters are found in everyday life, but they are unknown to fame because either loftiness of aim, or circumstances, or, above all, strength of passion has been lacking. They possess only stability. The great historic Stoics, as Epictetus and Thraseas —I speak not of their Sage, who is only an abstract ideal—have realized this higher type of will in its negative form—inhibition—conformably to the maxim of the school, Bear and refrain.

Below this grade of perfect coördination, there are characters that show an intermittence of coördination: whose center of gravity, while ordinarily stable, oscillates nevertheless from time to time. A group of tendencies will temporarily secede from the coördination, expressing, so far as they are active, one side of the character. Neither as regards themselves nor as regards others have these individuals the unity characteristic of strong wills; the more frequent and the more complex these infractions of perfect coördination, the less is the will power.

Lower in the scale we find lives in which two contrary or two different tendencies reign alternately. There are in the individual two alternating centers of gravity, two points of convergence for coördinations successively preponderant but partial. This type is perhaps the most common one, as we may convince ourselves by looking about us or by consulting the poets and the novelists of every age who are ever declaring that there are two natures in every one. The number of these successive coördinations may be larger still; but it is useless to pursue further this analysis.

One step more and we enter the region of pathology. Take a case where sudden and irresistible impulses hold the will every moment in check: here is an unduly strong tendency ever destroying the equilibrium, for its intensity will not allow of its being coördinated with the other tendencies: it commands instead of subordinating itself. And when such impulses have come to be not an accident but a habit, not one side of the character but the character itself, then there is only an

* Bastian, "The Brain as an Organ of Mind," chap. xxvi.
† François-Franck, *loc. cit.*
‡ *Loc. cit.*

intermittent coördination—it is the will that becomes the exception then.

Lower still, and will is simply accidental. In the indefinite succession of impulsions that vary from minute to minute, a chance volition finds only at long intervals its conditions of existence. Caprices take the place of volitions. The hysterical character furnishes the type of this perfect *incoördination*. Here we reach the final term of the will. At a grade lower than this there are no diseases of the will, but an arrest of development which precludes will altogether. Such is the state of idiots and imbeciles. We will add a few remarks upon these mental states in order to complete our pathological study.

"In profound idiocy," says Griesinger, "effort and determination to action are always instinctive. Generally they are prompted by the craving for food, and in most instances they possess the character of reflex actions of which the individual is hardly conscious. Certain simple ideas however may incite them to effort and movement, as when they amuse themselves by playing with bits of paper or the like. Without taking into account those sunk in the profoundest idiocy, the question arises, Is there here anything that represents will? What is there in them that can will?

"In many idiots of this last class the only thing that seems to arouse the mind in some degree to action, is the desire to eat. The lowest idiots manifest this desire only by grunts and bodily agitation. Those in whom mental degeneration has not gone so far move the lips or the hands slightly, or even cry: thus do they express their desire of food. In idiocy of a less pronounced type, the basis of the character is inconstancy and obtuseness of feeling and weakness of will. The humor of idiots belonging to this class depends on their surroundings and the treatment they receive. They are docile and obedient when well cared for, but perverse and malicious when ill used." *

Before we quit this subject, we would remark that if the will is a coördination, that is to say a sum of relations, it may be affirmed *a priori* that it will be of far rarer occurrence than simpler forms of psychic activity, because a complex state has much less chance of coming into existence and of enduring, than a simple state. And so it is in fact. If in any human life we take note of the parts played by automatism, by habit, by the passions, and above all by imitation, we shall find that the number of acts that are in the strict sense of the term purely voluntary is very small. For the majority of mankind imitation suffices: they are contented to accept that which has been matter of voluntary choice by others, and as they think in the thoughts, so they act with the will of the multitude. Viewed in connection with the habits that render it of no use, and with the diseases that maim or destroy it, the will, as we have already said, is a happy accident.

We need hardly observe how closely this coördination, ever growing more complex, of tendencies, which constitutes the different degrees of will, resembles the coördination, ever growing more complex, of sensations and mental images which constitutes the different degrees of intelligence. The one has for its basis and fundamental condition character, the other "forms of thought." They are each a more or less perfect adaptation of the individual to his surroundings whether in respect to action or to cognition.

We are now ready to formulate the general conclusion of this inquiry, already incidentally indicated. It will, I hope, throw light retrospectively upon the path we have been pursuing. It is as follows:

Volition is a final act of consciousness resulting from the more or less complex coördination of a group of states whether conscious, subconscious or unconscious (purely physiological) which all together find expression in an action or in an inhibition. The principal factor of the coördination is character, and character is simply the psychic expression of an individual organism. It is character which gives unity to the coördination, not the abstract unity of the mathematical point, but the concrete unity of a *consensus*. The act whereby this coördination takes place and is affirmed is choice founded on a natural affinity.

Thus volition, so often observed, analyzed and explained by subjective psychologists, is in our view simply a state of consciousness. It is only an effect of that psychophysiological activity, so often described, whereof a part only enters consciousness under the form of a deliberation. Furthermore, *volition is not a cause at all.* The acts and movements that follow volition result directly from the tendencies, feelings, mental images and ideas which have succeeded in being coördinated in the form of a choice: from this group comes all the efficiency. In other terms, and to leave no ambiguity, the psychophysiological work of deliberation results on the one hand in a state of consciousness,—the volition; on the other hand in a sum of movements or inhibitions. *The "I will" shows that a situation exists,*

* Griesinger, *opus citatum*, pp. 433, 434.

but does not constitute it. I should compare it to the verdict of a jury which may be the result of very passionate pleadings and of the charge of the judge, and which may be attended by grave consequences extending far into the future, *but which is an effect and not a cause*, being in law a simple determination, or ascertainment.

If the will be insisted on as a faculty, an entity, all is contradiction, obscurity, confusion. If on the contrary we take the facts as they are, we at least free ourselves of factitious difficulties. We do not have to ask ourselves how an "I will" can make my members to move. That is a mystery that does not need to be explained, for the simple reason that it does not exist, volition being in no sense a cause. We must look for the secret in the natural tendency of feelings and mental images to find expression in movements. Here we have only a very highly complicated case of the law of reflex action in which between the period of excitation and the motor period there appears a capital psychic fact—volition—showing that the first period ends and the second begins.

Observe further how the strange malady called aboulia may be easily explained, and with it the analogous forms considered in Chapter II., and even the simple feebleness of will—hardly a morbid state—so common among persons who say they have the will and act not. The explanation is that the individual organism had two effects to produce and produces only one—the state of consciousness, choice, affirmation; but the motor tendencies are too weak to pass into acts. There is sufficient coördination, but insufficient impulsion. In the case of irresistible acts, on the contrary, impulsion is in excess, while coördination is defective or non-existent.

Thus then we obtain from the study of the pathology these two results, viz., that the "I will" has no efficacy in producing action; and that will in the sane man is a coördination exceedingly complex and instable, and by reason of its very superiority easily broken up, being "the high est force yet introduced by nature—the last consummate efflorescence of all her wondrous works." *

* Maudsley, "Physiology of the Mind."

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NATURE AS VIEWED BY PRIMITIVE MAN.

The application of the scientific method to the study of man has given a wider meaning to the word "myth" than that commonly found in the dictionaries. These explain it as fable, as designedly fictitious, whether for amusement only, or to point a moral. The larger meaning which it holds to-day includes much more than this—to wit, the whole area of intellectual products which lie beyond the historic horizon and overlap it, effacing on nearer view the lines of separation. For the myth, as fable only, has no place for the crude fancies and grotesque imaginings of barbarous races of the present day, and of races at low levels of culture in the remote past. And so long as it was looked upon as the vagrant of fancy, with no serious meaning at the heart of it, and as corresponding to no yearning of man after the truth of things, sober treatment of it was impossible. But now that it, with its prolific offspring, legend and tradition, is seen to be a necessary travailing through which the mind of man passed in its slow progress toward certitude, the study and comparison of its manifold, yet, at the center, allied forms, and of the conditions out of which they arose, takes rank among the serious inquiries of our time.

Not that the inquiry is a new one. Five hundred years before Christ, *i.e.*, in the days of Euripides, the Greeks had identified the gods of their Olympus with the sun and sky, although Anaxagoras was sentenced to death and afterward banished for calling the moon a lump of lifeless matter, and in succeeding times myths were either emptied of their meaning or exalted to historic rank. In the hands of Christian apologists, from the ages of the Fathers to the present day "heathen" mythologies have been cited as witnesses to the corruptions of the faith, and, under the solvent of blundering etymologies, have been made to yield traces of a primitive revelation and of the doctrine of a Trinity! But if the inquiry is not a new one, the method of its prosecution is—a method justified by its works. Because, for the assigning of its due place in the order of man's mental and spiritual development to myth, there is needed that knowledge concerning his origin, concerning the conditions out of which he has emerged, and concerning the mythologies of lower races and their survival in unsuspected forms in the higher races, which was not only beyond the reach, but the conception also, of men until this century.

Except, therefore, as curiosities of literature, we may dismiss the Lemprière of our school-days, and with him "Casaubon"-Bryant and his key to all the mythologies—a key that fits no lock; with him, too, in all respect be it added, Mr. Gladstone, with his visions of the Messiah in Apollo, and of the Logos in Athênê.

After this short preface, we may start with the brief and plain statement, to be justified by what follows, that the birthplace of myth is in the endeavor of primitive man to interpret the meaning of his surroundings. By primitive man, I do not, of course, mean the nameless savage of the old Stone Age, who, if he had brains and leisure enough to make guesses about things, has left us no witness of the fact. His relics, and those of his successors to a period which is but as yesterday in the history of our kind, are material only, and not until we possess the symbols of man's thought, whether in language or rude picture, do we get an inkling of the meaning which the universe had for him, in the detail of his pitiless daily life, in the shapes and motions of surrounding objects, and in the majesty of the heavens above him. Even then the thought is more or less crystallized, and if we would watch it in the fluent form, we must have keen eye for the like process going on among savages yet untouched by the Time-Spirit, although higher in the scale than the Papuans and hill tribes of the Vindhya. For we cannot so far lull our faculty of thought as to realize the mental vacuity of the savage, but we may, from survivals nowadays, lead up to reasonable guesses of savage ways of looking at things in bygone ages, and the more so when we can detect relics of these among the ignorant and superstitious of modern times.

What meaning, then, had primitive man's surroundings to him when eye and ear could be diverted from prior claims of the body, and he could repose from watching for his prey and from listening to the approach of wild beast or enemy? He had the advantage, from greater demand for their exercise, in keener senses of sight, hearing, smell, and touch than we enjoy; nor did he fail to take in facts in plenty. Only there was this vital defect and difference, that in his brain every fact was pigeon-holed, charged with its own narrow meaning only, as in small minds among ourselves we find place given to inane, peddling detail, and no advance made to general and wide conception of things. In sharpest contrast to the poet's utterance—

> "Nothing in this world is single;
> All things by a law divine
> In each other's being mingle,"

every fact is unrelated to every other fact, and, therefore, interpreted wrongly.

Man, in his first outlook upon Nature, was altogether ignorant of the character of the forces by which he was environed; ignorant of that unvarying relation between effect and cause which it needed the experience of ages and the generalizations therefrom to apprehend, and to express as "laws of nature." He had not even the intellectual resource of later times in inventing miracle to explain where the necessary relation between events seemed broken or absent.

His first attitude was that of wonder, mingled with fear—fear as instinctive as the dread of the brute for him. The sole measure of things was himself; consequently, everything that moved or that had power of movement, did so because it was alive. A personal life and will was attributed to sun, moon, clouds, river, waterfall, ocean, and tree, and the varying phenomena of the sky at dawn or noonday, at gray eve or black-clouded night, were the manifestation of the controlling life that dwelt in all. In a thousand different forms this conception was expressed. The thunder was the roar of a mighty beast; the lightning a serpent darting at its prey, an angry eye flashing, the storm demon's outshot forked tongue; the rainbow a thirsty monster; the waterspout a long-tailed dragon. This was not a pretty or powerful conceit, not imagery, but an explanation. The men who thus spoke of these phenomena meant precisely what they said. What does the savage know about heat, light, sound, electricity, and the other modes of motion through which the Proteus force beyond our ken is manifest? How many persons who have enjoyed a "liberal" education can give correct answer, if asked off-hand, explaining how glaciers are born of the sunshine, and why two sounds, travelling in opposite directions at equal velocities, "interfere" and cause silence? I have been surprised at the number of young men, hailing from schools of renown, who have given me the most ludicrous replies when asked the cause of day and light, and the distance of the earth from the sun.

That the comparison between things inanimate and animate arising from su-

perficial analogies is inborn in the savage, is illustrated all the world over. The North American Indians prefer a hook that has caught a big fish to the handful of hooks that have never been tried, and they never lay two nets together, lest they should be jealous of each other. The Bushmen thought that the traveler Chapman's big wagon was the mother of his smaller ones; and the natives of Tahiti sowed in the ground some iron nails given them by Captain Cook, expecting to obtain young ones. When that ill-fated discoverer's ship was sighted by the New Zealanders, they thought it was a whale with wings. The king of the Coussa Kaffirs, having broken off a piece of the anchor of a stranded ship, soon afterward died, upon which all the Kaffirs made a point of saluting the anchor very respectfully whenever they went near it, regarding it as a vindictive being. But, perhaps, one of the most striking and amusing illustrations is that quoted by Sir John Lubbock from the "Smithsonian Reports," concerning an Indian who had been sent by a missionary to a colleague with four loaves of bread, accompanied by a letter stating their number. The Indian ate some of the bread, and his theft was, of course, found out. He was sent on a second errand with a similar batch of bread and a letter, and repeated the theft, but took the precaution to hide the letter under a stone while he was eating the loaves, so that it might not see him!

As the individual is a type of the race, so in the child's nature we find analogy of the mental attitude of the savage ready to hand. To the child everything is alive. With what timidity and wonder he first touches a watch, with its moving hands and clicking works; with what genuine anger he beats the door against which he has knocked his head, whips the rocking-horse that has flung him, then kisses and strokes it the next moment in token of forgiveness and affection. Even among civilized adults, as Mr. Grote remarks, "the force of momentary passion will often suffice to supersede the acquired habit, and an intelligent man may be impelled in a moment of agonizing pain to kick or beat the lifeless object from which he has suffered." The mental condition which causes the wild native of Brazil to bite the stone he stumbled over, may, as Dr. Tylor has pointed out in his invaluable work on "Primitive Culture," be traced along the course of history, not merely in impulsive habit, but in formally enacted law. If among barbarous peoples we find, for example, the relatives of a man killed by a fall from a tree taking their revenge by cutting the tree down and scattering it in chips, we find a continuity of idea in the action of the court of justice held at the Prytaneum in Athens to try any inanimate object, such as an axe, or a piece of wood, or stone, which had caused the death of any one without proved human agency, and which, if condemned, was cast in solemn form beyond the border. "The spirit of this remarkable procedure reappears in the old English law, repealed only in the present reign, whereby not only a beast that kills a man, but a cart-wheel that runs over him, or a tree that falls on him and kills him, is deodand, or given to God, *i.e.*, forfeited and sold for the poor." Among ancient legal proceedings in France we read of animals condemned to the gallows for the crime of murder, and of swarms of caterpillars which infected certain districts being admonished to take themselves off within a given number of days on pain of being declared accursed and excommunicated. When the New Zealander swallows his dead enemy's eye that he may see further, or gives his child pebbles to make it stony and pitiless of heart; when the Abipone eats tiger's flesh to increase his courage, such confusion in the existence of transferable qualities as these acts imply, has its survivals in the old wives' notion that the eye-bright flower, which resembles the eye, is good for diseases of that organ, in the medical remedy for curing a sword-wound by nursing the weapon that caused it, and in the old adage, "take a hair of the dog that bit you"—as the Scandinavian Edda says, "Dogs, hairs heal dogs, bites."

II.

PERSONIFICATION OF THE POWERS OF NATURE.

In selecting illustrations from the literature of savage mythology, the material overburdens us by its richness. Much of it is old, and, like refuse-heaps in our mining districts, once cast aside as rubbish, but now made to yield products of value, it has, after long neglect, been found to contain elements of worth, which patience and insight have extracted from its travelers' tales and quaint speculations. That for which it was most prized in the

days of our fathers is now of small account; that within it which they passed by we secure as of lasting worth. Much of that literature is, however, new, for the impetus which has in our time been given to the rescue and preservation of archaic forms has reached this, and a host of accomplished collectors have secured rich specimens of relics, which in the lands of their discovery have still the authority of the past, unimpaired by the critical exposure of the present.

The subject itself is, moreover, so wide reaching, bringing the ancient and the modern into hitherto unsuspected relation, showing how in customs and beliefs, to us unmeaning and irrational, there lurk the degraded representations of old philosophies, and in what seems to us burlesque, the survivals of man's most serious thought.

One feels this difficulty of choice and this temptation to digress in treating of that confusion inherent in the savage mind between things living and not living, which was the main subject of my former paper. By numberless illustrations at hand, this confusion might be shown to extend to the names or images of persons, and to the persons themselves, as well as to other relations which are purely symbolical.

For example, the practice of burning or hanging in effigy, by which a crowd expresses its feelings toward any unpopular person, is a relic of the old belief in a real and sympathetic connection between a man and his image; a belief extant among the unlettered in by-places of civilized countries. When we hear of North American tribes making images of their foes, whose lives they expect to shorten by piercing these images with their arrows, we remember that these barbarous folk have their representatives among us in the Devonshire peasant, who hangs in his chimney a pig's heart stuck all over with thornprickles, so that the heart of his enemy may likewise be pierced. The practice among the Dyaks of Borneo, of making a wax figure of the foe, so that his body may waste away as the wax is melted, will remind the admirers of Dante Rossetti, how he finds in a kindred mediæval superstition the subject of his poem "Sister Helen," while they who prefer the authority of sober prose may turn to that storehouse of the curious, Brand's "Popular Antiquities." Brand quotes from King James, who, in his "Dæmonology," book ii. chap. 5, tells us that "the devil teacheth how to make pictures of wax or clay, that by roasting thereof the persons that they bear the name of may be continually melted or dried away by continual sickness;" and also cites Andrews, the author of a "Continuation of Henry's Great Britain," who, speaking of the death of Ferdinand, Earl of Derby, by poison, in the reign of Elizabeth, says: "The credulity of the age attributed his death to witchcraft. The disease was odd, and operated as a perpetual emetic; and a waxen image, with hair like that of the unfortunate earl, found in his chamber, reduced every suspicion to certainty." The passage from practices born of such beliefs to the use of charms as protectives against the evil-disposed and those in league with the devil, and as cures for divers diseases, is obvious. But upon this it is not needful to dwell; what has been said will suffice to show that the superstitious man is on the same plane as the savage, but, save in rare instances, without such excuse for remaining, as Bishop Hall puts it, with "old wives and starres as his counsellors, charms as his physicians, and a little hallowed wax as his antidote for all evils."

But we have traveled in brief space a long way from our picture of primitive man, weaving out of streams and breezes and the sunshine his crude philosophy of personal life and will controlling all, to the peasant of to-day, his intellectual lineal descendant, with his belief in signs and wonders, his forecast of fate and future by omens, by dreams, and by such pregnant occurrences as the spilling of salt, the howling of dogs, and changes of the moon—in short, by the great mass of superstitions which yet more or less influence the intelligent, terrorize the ignorant, and delight the student of human development.

As, however, a good deal hinges upon the evidences in savage myth-making of the personification of the powers of nature, we must return to this for awhile. Obviously, the richest and most suggestive material would be supplied by the striking phenomena of the heavens, chiefly in sunrise and sunset, in moon, star, star-group, and meteor, cloud and storm, and, next in importance, by the strange and terrible among phenomena on earth, whether in the restless waters, the unquiet trees, the grotesquely-shaped rocks, and the fear inspired in man by creatures more powerful than himself. Though the whole range of the lower culture, sun, moon, and constellations are spoken of as living creatures, often as ancestors, he-

roes, and benefactors who have departed to the country above, to heaven, the *heaved* uplifted land. The Tongans of the South Pacific say that two ancestors quarreled respecting the parentage of the first born of the woman Papa, each claiming the child as his own. No King Solomon appears to have been concerned in the dispute, although at last the infant was cut in two. Vatea, the husband of Papa, took the upper part as his share and forthwith squeezed it into a ball and tossed it into the heavens, where it became the sun. Tonga-iti sullenly allowed the lower half to remain a day or two on the ground. But seeing the brightness of Vatea's half, he compressed his share into a ball and tossed it into the dark sky, during the absence of the sun in the nether world. Thus originated the moon, whose paleness is owing to the blood having all drained out of Tonga-iti's half as it lay upon the ground. Mr. Gill, from whose valuable collection of southern myth this is quoted, says that it seems to have its origin in the allegory of an alternating embrace of the fair Earth by Day and Night. But despite the explanations, more or less strained, which some schools of comparative mythologists find for every myth, the savage is not a conscious weaver of allegories, or an embryo Cabalist, and we shall find ourselves more in accord with the laws of his intellectual growth if, instead of delving for recondite and subtle meanings in his simple-sounding explanations of things, we take the meaning to be that which lies on the surface. More on this, however, anon. Among the Red Races, one tribe thought that sun, moon, and stars were men and women who went into the sea every night and swam out by the east. The Bushmen say that the sun was once a man who shed light from his body, but only for a short distance, until some children threw him into the sky while he slept, and thus he shines upon the wide earth. The Australians say that all was darkness around them till one of their many ancestors, who still shine from the stars, shedding good and evil, threw, in pity for them, an emu's egg into space, when it became the sun. Among the Manacicas of Brazil, the sun was their culture-hero, virgin-born, and their jugglers, who claimed power to fly through the air, said that his luminous figure, as that of a man, could be seen by them, although too dazzling for common mortals.

The sun has been stayed in his course in other places than Gibeon, although by mechanical means of which Joshua appears to have been independent. Among the many exploits of Maui, abounding in Polynesian myth, are those of his capture of the sun. He had like Prometheus, snatched fire from heaven for mortals, and his next task was to cure Ra, the sun-god, of his trick of setting before the day's work was done. So Maui plaited thick ropes of cocoanut fiber, and taking them to the opening through which Ra climbed up from the nether world, he laid a slip-noose for him, placing the other ropes at intervals along his path. Lying in wait as Ra neared, he pulled the first rope, but the noose only caught Ra's feet. Nor could Maui stop him until he reached the sixth rope, when he was caught round the neck and pulled so tightly by Maui that he had to come to terms, and agree to slacken his pace for the future. Maui, however, took the precaution to keep the ropes on him, and they may still be seen hanging from the sun at dawn and eve. In Tahitian myth, Maui is a priest, who, in building a house which must be finished by daylight, seizes the sun by its rays and binds it to a tree till the house is built. In North American myth, a boy had snared the sun, and there was no light on the earth. So the beasts held council who should undertake the perilous task of cutting the cord, when the dormouse, then the biggest among them, volunteered. And it succeeded, but so scorched was it by the heat that it was shriveled to the smallest of creatures. Such a group of myths is not easy of explanation; but when we find the sun regarded as an ancestor, and as one bound, mill-horselike, to a certain course, the notion of his control and check would arise, and the sun-catchers take their place in tradition among those who have deserved well of their race. It is one among numberless aspects under which the doings of the sun and of other objects in nature are depicted as the doings of mortals, and the crude conceptions of the Ojibwas and the Samoans find their parallel in the mythologies of our Aryan ancestors. Only in the former we see the mighty one shorn of his dignity, with noose round his neck or chains on either side; whilst in the latter we see him as Herakles, with majesty unimpaired, carrying out the twelve tasks imposed by Eurystheus, and thus winning for himself a place among the immortals.

III.

THE SUN AND MOON IN MYTHOLOGY.

THE names given to the sun in mythology are as manifold as his aspects and influences, and as the moods of the untutored minds that endowed him with the complex and contrary qualities which make up the nature of man. *Him*, we say, not *it*, thus preserving in our common speech a relic, not only of the universal personification of things, but of their division into sex.

The origin of gender is most obscure, but its investment of both animate and inanimate things with sexual qualities shows it to be a product of the mythopœic stage of man's progress, and demands some reference in these papers. The languages of savages are in a constant state of flux, even the most abiding terms, as numerals and personal pronouns, being replaced by others in a few years. And the changes undergone by civilized speech have so rubbed away and obscured its primitive forms that, look where he may, the poverty of the old materials embarrassess the inquirer. If the similar endings to such undoubtedly early words as father, mother, brother, sister, in our own and other related languages, notably Sanskrit, afford any clue, it goes rather to show that gender was a later feature than one might think. But there is no uniformity in the matter. It seem pretty clear that in the early forms of our Indo-European speech there were two genders only, masculine and feminine. The assignment of certain things conceived of as sexless to neither gender, *neutrius generis*, is of later origin. Some of the languages derived from Latin, and, to name one of a different family, the Hebrew, have no neuter gender, whilst others, as the ancient Turkish and Finnish, have no grammatical gender. In our own, under the organic changes incident to its absorption of Norman and other foreign elements, gender has practically disappeared (although ships and nations are still spoken of as feminine), the pronouns *he, she, it*, being its representative. Such a gain is apparent when we take up the study of the ancestral Anglo-Saxon, with its masculine, feminine, and neuter nouns, or of our allied German with its perplexities of sex, as, *e.g.*, its masculine spoon, its feminine fork, its neuter knife. Turning for a moment to such slight aid as barbaric speech gives, we find in the languages of the hill tribes of South India a curious distinction made; rational beings, as gods and men, being grouped in a "high caste or major gender," and living animals and lifeless things in a "casteless or minor gender." The languages of some North American and South African tribes make a distinction into animate and inanimate gender; but, as non-living things, the sun, the thunder, the lightning, are regarded as persons, they are classed in the animate gender.

Further research into the radicals of so relatively fixed a language as Chinese, and into more mobile languages related to it, may, perhaps, enlighten the present ignorance; but one thing is certain, that language was "once the scene of an immense personification," and has thereby added vitality to myth. Analogies and conceptions apparent to barbaric man, and in no way occurring to us, caused him to attribute sexual qualities not only to dead as to living things, but to their several parts, as well as, in the course of time, to intellectual and abstract terms. Speaking broadly, things in which were manifest size and qualities, as strength, independence, governing or controlling power, usually attaching to the male, were classed as masculine; whilst those in which the gentler and more subordinate features were apparent were classed as feminine. Of course, marked exceptions to this will at once occur to us, as, *e.g.*, in certain savage and civilized languages, where the sun is feminine and the moon is masculine, but in the main the division holds good. The big is male, and the small is female. The Dyaks of Borneo call a heavy downpour of rain a *he* rain; and, if so strength-imparting a thing as bread is to be classed as either masculine or feminine, we must agree with the negro who, in answer to his master's question, "Sambo, where's the bread?" replied, "De bread, massa? him lib in de pantry." The mediæval Persians are said to have distinguished between male and female even in such things as food and cloth, air and water, and prescribed their proper use accordingly; while, as Dr. Tylor, from whom the above is quoted, adds, "even we, with our blunted mythologic sense, cannot give an individual name to a lifeless object, such as a boat or a weapon, without in the very act imagining for it something of a personal nature."

But we must not stay longer in these attractive byways of philology, however warranted the digression may be, and must return to the many-titled sun.

While in the more elaborate mythologies of classic peoples we find him addressed in exalted terms which are still the metaphors of poetry, we are nearer the rough material out of which all myth is shaped when among races who speak of sun, moon, and stars as father, mother, and children, and who mean exactly what they say. We may find similar relationships in the solar and lunar deities of Egyptian and classic myth, but profound moral elements have entered into these and dissolved the material. We are face to face with the awful and abiding questions personified in Osiris and Isis, in Œdipus and Jocaste, where for us the sunlight pales and the storm clouds are dispersed before the dazzling mysteries of human life and destiny.

No such matters confront us when in Indian myth we read that the moon is the sun's sister, an aged, pale-faced woman, who in kindness led to her brother two of the tribe who had sprung through a chasm in the sky to the pleasant moonlit land. Neither do they in Australian myth, which shows that the dwellers on Olympus had no monopoly of conjugal faithlessness. For in it the moon's motions are explained as the chase of a jealous husband, one of the bright stars, who found the inconstant in the act of eloping with the moon. Among the bushman, the moon has incurred the sun's anger and is hacked smaller and smaller by him, till, begging for mercy, a respite is given. But as soon as he grows larger the sun hacks him again. In Slavonic myth the sun cleaves him through, for loving the morning star. The Indians of the far west say that, when the moon is full, evil spirits begin nibbling at it, and eat a portion every night till it is all gone; then a great spirit makes a new moon, and, weary with his toil, falls asleep, when the bad spirits renew their attack. Another not uncommon group of myths is that which speaks of sun and moon as borne across the heavens on the backs of ancestors, as in Greek myth Atlas supports the world.

But a still larger and more widespread body of myth has its source in the patches on the moon's face. In the Samoan Islands there are said to be a woman, a child, and a mallet. A woman was once hammering out paper cloth, and seeing the moon rise, looking like a great bread-fruit tree, she asked it to come down and let her child eat a piece of it. But the moon was very angry at the idea of being eaten, and gobbled up woman, child, and mallet, and there they are to this day. The Selish Indians of North-Western America say that the little wolf was in love with the toad, and pursued her one moonlight night, till, as a last chance, she made a desperate spring on to the face of the moon, and there she is still. In Greenland myth, the moon was in love with his sister and stole in the dark to caress her. She, wishing to find out who her lover was, blackened her hands so that the marks might be left on him, which accounts for the spots. The Khasias of the Himalaya say that the moon falls in love every month with his mother-in-law, who, like a well-conducted matron, throws ashes in his face.

Comparing these with our familiar myths, we have our own Man in the Moon, who is said to be the culprit found by Moses gathering sticks on the Sabbath, although his place of banishment is a popular addition to the Scripture narrative. According to the German legend he was a scoffer who did the same heinous offense on a Sunday, and was given the alternative of being scorched in the sun or frozen in the moon. The Frisians say that he stole cabbages, the load of which he bears on his back. In Icelandic myth the two children familiar to us as Jack and Jill were kidnaped by the moon, and there they stand to this day with bucket on pole across their shoulders, falling away one after the other as the moon wanes,—a phase described in the couplet:

> Jack fell down and broke his crown,
> And Jill came tumbling after.

Mr. Baring Gould, whose essay on this subject in his "Curious Myths of the Middle Ages" gives a convenient summary of current legends, contends that Jack and Jill are the Hjuki and Bil of the Edda, and signify the waxing and waning of the moon, their bucket indicating the dependence of rainfall on her phases,—a superstition extant among us yet.

Poetry has made the man in the moon its theme. Dante calls him Cain: Chaucer describes him

> Bearing a bush of thorns on his back
> Whiche for his theft might clime so ner the heaven;

and Shakespeare refers to him in "Midsummer Night's Dream" and the "Tempest."

The group of customs observed

among both barbaric and civilized peoples at the changes of the moon, customs which are meaningless except as relics of lunar worship, will be more fitly referred to when we deal with the passage of mythology into religion, of personifying into deifying.

IV.

THE THEORIES OF CERTAIN COMPARATIVE MYTHOLOGISTS.

MANIFOLD are the phases of Nature; manifold is the life of man; and we must not lend a too willing ear to theories which refer the crude explanations of an unscientific age, when the whole universe is Wonderland, to one source. *Cave hominem unius libri*, says the adage, and we may apply it, not only to the man of one book, but also to the man of one idea, in whom the sense of proportion is lacking, and who sees only that for which he looks. Here such caution is introduced as needful of exercise toward the comparative mythologists who, not content with showing—as abundant evidence warrants—that myth has its germs in the investment of the powers of nature with personal life and consciousness, contend that the great epics of our own and kindred races are, from their broadest features to minute detail, but nature-myths obscured and transformed.

Certain scholars, notably Sir G. W. Cox and Professor de Gubernatis, as interpreters of the myths of the Indo-European peoples, and Dr. Goldziher, as an interpreter of Hebrew myth and cognate forms, maintain that the names given in the mythopœic age to the sun, the moon, and the changing scenery of the heaven as the myriad shades and fleeting forms passed over its face, lost their original signification wholly or partially, and came to be regarded as the names of veritable deities and men, whose actions and adventures are the disguised descriptions of the sweep of the thunder-charged clouds and of the victory of the hero-god over their light-engulfing forces. But it is better to state the theory in the words of its exponents, and for that purpose a couple of extracts from Sir George Cox's "Mythology of the Aryan Nations" will suffice.

"In the spontaneous utterances of thoughts awakened by outward phenomena, we have the source of myths which must be regarded as *primary*. But it is obvious that such myths would be produced only so long as the words employed were used in their original meaning. If once the meaning of the word were either in part or wholly forgotten, the creation of a new personality under this name would become inevitable, and the change would be rendered both more certain and more rapid by the very wealth of words which were lavished on the sights and objects which most impressed their imagination. A thousand phrases would be used to describe the action of a beneficent or consuming sun, of the gentle or awful night, of the playful or furious wind; and every word or phrase become the germ of a new story as soon as the mind lost its hold on the original force of the name. Thus, in the polyonymy" (by which term Sir Geo. Cox means the giving of several names to one object) "which was the result of the earliest form of human thought we have the germ of the great epics of later times, and of the countless legends which make up the rich stores of mythical tradition. and the legends so framed constitute the class of *secondary* myths" (p. 42).

"Henceforth the words which had denoted the sun and moon would denote not merely living things but living persons. . . . Every word would become an attribute, and all ideas, once grouped round a single object, would branch off into distinct personifications. The sun had been the lord of light, the driver of the chariot of the day; he had toiled and labored for the sons of men, and sunk down to rest, after a hard battle, in the evening. But now the lord of light would be Phoibos Apollôn, while Helios would remain enthroned in his fiery chariot, and his toils and labors and death-struggles would be transferred to Herakles. The violet clouds which greet his rising and his setting would now be represented by herds of cows which feed in earthly pastures. There would be other expressions which would still remain as floating phrases, not attached to any definite deities. These would gradually be converted into incidents in the life of heroes, and be woven at length into systematic variations. Finally, these gods and heroes, and the incidents of their mythical career, would receive each 'a local habitation and a name.' These would remain as genuine history when the origin and meaning of the words had been either wholly or in part forgotten" (p. 51).

Such is the "solar myth" theory, the general principles of which are sound enough, but the unqualified application of which has caused recoil in many minds inclined to its acceptance. "We can hardly," as Mr. Matthew Arnold says, "now look up at the sun without having the sensations of a moth," and if occasion has not been given to the adversary to blaspheme, he has been supplied with

ample material for banter and ridicule. Some of the happiest illustrations of this are made by Mr. Foster in his amusing and really informing essay on "Nature Myths in Nursery Rhymes," reprinted in "Leisure Studies," an essay which it seems the immaculate critics took *au sérieux!* With a little exercise of one's invention, given also ability to parody, it will be found that many noted events, as well as the lives of the chief actors in them, yield results comforting to the solar mythologists. Not only the Volsungs and the Iliad, but the story of the Crusades and of the conquest of Mexico; not only Arthur and Baldr, but Cæsar and Bonaparte, may be readily resolved, as Professor Tyndall says we all shall be, "like streaks of morning cloud, into the infinite azure of the past." Dupuis, in his researches into the connection between astronomy and mythology, had suggested that Jesus was the sun, and the twelve apostles the zodiacal signs; and Goldziher, analyzing the records of a remote period, maintains the same concerning Jacob and his twelve sons. M. Senart has satisfied himself that Gautama the Buddha, is a sun-myth. Archbishop Whately, to confound the skeptics, ingeniously disproved the existence of Bonaparte; and a French ecclesiastic has by witty etymological analogies shown that Napoleon is cognate with Apollo, the sun, and his mother Letitia identical with Leto, the mother of Apollo; that his *personnel* of twelve Marshals were the signs of the zodiac, his retreat from Moscow a fiery setting, and his emergence from Elba, to rule for twelve years, and then be banished to St. Helena, the sun rising out of the eastern waters to set in the western ocean after twelve hours' reign in the sky. But upon this solar theory, let us cite what Dr. Tylor, whose soberness of judgment renders him a valuable guide along the zigzag path of human progress, says:—"The close and deep analogies between the life of nature and the life of man have been for ages dwelt upon by poets and philosophers, who, in simile or in argument, have told of light and darkness, of calm and tempest, of birth, growth, change, decay, dissolution, renewal. But no one-sided interpretation can be permitted to absorb into a single theory such endless many-sided correspondences as these. Rash inferences which, on the strength of mere resemblance, derive episodes of myth from episodes of nature, must be regarded with utter mistrust, for the student who has no more stringent criterion than this for his myths of sun and sky and dawn, will find them wherever it pleases him to seek them."

The investigations of comparative mythologists, more particularly in this country and Germany, have thrown such valuable light on the history of civilization that it will be instructive to learn what excited the inquiry, on what facts the solar theory rests, and what other facts its supporters overlook.

The researches of Niebuhr and his school into the credibility of early history made manifest that the only authority on which the chroniclers relied was tradition. To them—children of an uncritical age—that tradition was venerable with the lapse of time, and binding as a revelation from the gods. To us the charm and interest of it lie in detecting within it the ancient deposit of a mythopœic period, and in deciphering from it what manner of men they must have been among whom such explanation of the beginnings had credence. And in such an inquiry nothing can be "common or unclean," nothing too trivial or puerile for analysis; for where the most grotesque and impossible are found, there we are nearer to the conditions of which we would know more.

The serious endeavor to get at the fact underlying the fabulous was extended to the great body of mythology which had not been incorporated into history, and the interpretations of which satisfied only those who suggested them. As hinted already, the Greeks had sought out the meaning of their myths, with here and there a glimpse of the truth gained; but this was confined to the philosophers and poets. Euhêmeros degraded them into dull chronicle, making Herakles a thief who carried off a crop of oranges; Jove a king crushing rebellion; Atlas an astronomer; Python a freebooter; Æolus a weather-wise seaman, and so on. Plutarch tried to "restore" them, but only defaced them, and after centuries of neglect they were discovered by Lord Bacon to be allegories with a moral. Then Banier and Lempriere emptied out of them what little life Euhêmeros had left, and the believers in Hebrew as the original speech of mankind saw in them the fragments of a universal primitive revelation! Even the distinguished scholar, Professor Max Müller, is so upset by the many loathsome and revolting stories in a mythology current in the land of Lykurgos and Solon, that he can account for

them only by assuming "a period of temporary insanity through which the human mind had to pass," and a degradation from lovely metaphor to coarse fact which only a "disease of language" explains. There is, however, no need for assumptions of this or of any other kind, for language itself reveals the origin of myth, and shows it to be in keeping with all that is elsewhere established concerning primitive modes of thinking.

V.

ARYAN MYTHOLOGY.

We said that language lays bare the mental condition under which myths are formed; in other words, that speech reveals the limitations of thought. It would be a useful corrective of theories concerning the origin of language to which many are yet wedded to show that not only terms for things material and concrete, but also for things immaterial and abstract, are of purely physical origin—that is to say, have been chosen from their analogy to something real. As an example, the several verbs whose relics survive in the substantive verb *to be* had each a distinct physical meaning. "Am," "are," "is," are derived from *as* (in Sanskrit *asu*, "life,"), meaning "to breath" or "sit"; "was" and "were" from *vas*, "abide"; and in "be" and "been" (from *bnû*, a Sanskrit cognate with Latin *fu*, Greek *phy*, "to grow") are contained the idea of *growing*. But to follow this would take us from the main business of these papers; enough that, out of manifold combinations of a few inarticulate or unjointed sounds, the larger proportion of which were imitative, have arisen the languages of the world, from the meager stock of words of the unlearned and the savage, to the nobly and expanding vocabularies of educated men.

Passing to the facts upon which the solar theory of myths rests, the following stands foremost. The researches of scholars, notably of the German Bopp and Jacob Grimm, have shown that the languages spoken in Europe by the Keltic, Teutonic, Slavonic, Greek, and Latin races, and in Asia by the Hindus, Persian, and some lesser people, are the common decendants, under modifications through various causes, of one mother-tongue known as the Aryan (from a Sanskrit word cognate with the root *ar* to plow) a term applied in the Vedas to the dominant occupiers of the soil, the "tillers" in India, who spoke it. The above group of languages is also called the Indo-Germanic, and, with more appropriateness, as roughly defining the races included therein, the Indo-European. Of course, wherever the several branches of the old Aryan family finally settled they mixed more or less with the aboriginal races, whom they conquered. But, making such allowances as this demands, it holds good that people to-day, so unlike in complexion, physique, color of hair, and speech, as the Hindoo and the Icelander, the Russian and the Englishman, the Persian and the German, are the offspring of common ancestors, of whom, although no material relics survive, language remains to attest what considerable advance from primitive savagery they had made. Wave after wave of immigrants, among the earliest being the Kelt, followed one another westward, to wrestle for the fairest lands; so that when, centuries later, the veteran legions of Cæsar crossed swords with the Belgæ in this island, they fought against men remotely kin to themselves both in language and in blood.

Furthermore, the evidence which has yielded this most interesting fact also shows that the old Aryans, before they separated into tribes, each of varying dialect, had a common mythology. This, which had its source, as myth everywhere had, in man's endeavor to interpret the meaning of his surroundings, developed into a deification of the powers of nature, and likewise become the groundwork of traditional history, as well as the source of legend, folk-lore, and folk-tale. So venerable are these last-named in their antiquity, that the nursery stories told in Iceland and in the Tyrol, in the Highlands and in the Deccan, are identical. After allowing for local coloring, and for changes incident to the lapse of time, they are the variants of stories related to children in the Aryan fatherland at a period historically remote, and moreover are told in words which are phonetically akin. Their correspondences, often extending to minor detail, are not explained by any theory of borrowing, for no trace of intercourse between Aryans of the East and West occurs until long after the domiciling of the stories where we find them. Nor did they, with such close resemblances as appear between the German Faithful John, and the Hindu Rama and

Luxman, and between our own Cinderella, the German Aschenputtal, and the Hindu Sodrwa Bai, spring native from their respective soils. And there is just that unlikeness in certain detail which might be expected from the different positions and products of the several Aryan lands. They explain, for example, the absence from Scandinavian folk-love of creatures like the elephant, the giant ape and turtle, which figure in Brahmanic beast epic. Now, what is true of the folk-tales applies with added force to the mythologies. In the great epics of the Greeks, the Iliad and Odyssey; of the Norsemen, the Volsungs; of the Germans, the Nibelungs; of the English, King Arthur and his Round Table Knights; of the Hindus, the Ramâyanâ and Mahâbhâratâ; of the Persians, the Shâh Nâmeh; we find similarities of incident and episode which are inexplicable, except upon the theory of a common origin. So far as the names and characteristics of the heroes and heroines are concerned, their phonetic identity reveals that common origin, while their analysis explains their common meaning.

The key to this is the Sanskrit language. In the history of the Indo-European family of speech, it served as the starting-point, because, although not the ancestor, it is the eldest member, and has more than the others preserved its roots and suffixes in a more perfect form. And in the history of Indo-European mythology, it is in the ancient Vedic texts, chiefly the Rig-Veda, that we find the materials for comparative study, since in these venerable hymns of a Bible older than our own are preserved the earliest extant forms of Aryan myth.

The method adopted was to compare a number of the Greek names of gods and heroes of somewhat obscure meaning with names of Vedic deities whose meaning is clear. The phonetic relationship between the two sets of names, hidden as it is by the interchange of sounds, is proved by the law which governs such interchange or "permutation of consonants," known, after its discoverer, as "Grimm's law." The causes of this are not easy to ascertain, but they are referable to physical influences, as climate and conditions of life, which in the course of time bring about changes in the organs of speech—such, for example, as make *th* so difficult of pronunciation to a German, in whose language *d* takes its place, as *drei* for *three*, *durstig* for *thirsty*, *dein* for *thine*, etc. We may note tendencies to variation in children of the same household, their prattle often affording striking illustration of Grimm's law, and it is easy to see that among semi-civilized and isolated tribes, where no check upon the variations is imposed, they would tend to become fixed and give rise to new dialects.

The method has been justified by its works. The familiar myth of the birth of Athênê gives a good illustration of this. She is said to have been the daughter of Zeus, and to have sprung from his forehead. Now the Greek *Zeu*, the Latin *Deus* (whence the French *Dieu* and our *deity*), the Lithuanian *diewas*, and the Sanskrit *Dyaus*, all come from an old Aryan root *div*, or *dyu*, meaning "to shine." The Sanskrit *dyu*, as a noun, means "sky" or "day," and in the Veda, *Dyaus* is the bright sky or heaven. Athênê is the Sanskrit Atanâ, one of the many Vedic names for the dawn. Thus the primitive meaning of the myth comes out; the dawn springs from the forehead of the sky; the daybreak appears rising from the East. But the Greek, in whose Pantheon Zeus had been exalted as god of gods, did not dream that to his remote ancestor that god was but the sky personified and deified; even his philosophers had traced it to the root *zeu*, "to live," and forever lost the track.

Ouranos, or Uranus, is the Vedic Varuna, the all-surrounding heaven, from a root *var*, to veil or cover; Helen, stolen by Paris (in Sans. *Pani*, "the deceiver") from Sparta, is the Vedic Saramâ, the dawn, from the root, *sar*, to creep; the Charites, or Graces, are the Harits, or bright courses of the sun, from *ghar*, to shine, whence the idea of splendor in its transfer to the fair women who attended Aphrodite; the Erinyes, or Furies, are the Saranyû, or dawn, which brings evil deeds to light. Hence, they who did this became regarded as avengers, whose fury pursued the wrong-doer.

These comparisons might be followed throughout the whole range of classic as well as of Teutonic and other epic with the like result. They apply equally to the mythical phrases in which the adventures and general career of the gods and heroes are narrated, for the details of which my readers are referred to such works as Sir G. W. Cox's "Mythology of the Aryan Nations" and "Tales of Ancient Greece." That these majestic epics have one and all their germs in the phenomena of the natural world and the course of the day and year, seems to me demonstrated. But when the solar mythologists contend that "there is absolute

ly nothing left for furthur analysis in the stories," that every incident has its birth in the journey of the sun, the death of the dawn, the theft of the twilight by the powers of darkness, we rebel against so sweeping an application of the theory. They are nature-myths, but they are much more than that; the impetus that has shaped them as we now know them came from other forces than clouds and storms, and it is with these that our next paper must be concerned.

VI.

THE PRIMITIVE-NATURE MYTH TRANSFORMED.

In a former paper, the facts on which the solar theory rests were summarized as witnessing to its inherent soundness, and we must now glance at certain other facts which are overlooked by its exponents. A needful task; because the claims preferred on its behalf to explain every incident in the complex mythology of the Greek and other races has caused a recoil in minds otherwise well disposed toward it. In fact, any one reading, without such caution as this paper is designed to supply, the minute analyses of myths in the writings of those who interpret them solely by the philological method, would conclude that it had laid bare the meteorological origin of every epic and folk-tale among the Indo-European peoples. He would learn that in a way rudely analogous to the supernatural guidance of the Christian Church, the several Aryan tribes had received from the fathers of the race an unvarying canon of interpretation of the primitive myths, a canon preserved with the jealous veneration with which the Jew regarded the Thorah and the Brahman the Veda. He would also learn that the details of Norse and classic myth can be traced to the Veda, that these details, not of incident alone, but of thought and expression, survived unimpaired by time and untouched by circumstance, while, strange to say, the more prominent names and the leading characters became obscured in their meaning. Strange indeed, but not true. For what is the fact?

Long before the hymns of the Rig-Veda existed as we know them (and they have remained an inviolate sacred text since 600 B.C., when every word, verse, and syllable were counted), the Aryan tribes had swarmed from their parent hive across boundless steppes and over winding mountain passes, some westward into Europe, others southward into Hindustan. Among the slender intellectual capital of which they stood possessed was the common mythology of their ancestors, in which, as we have seen, sun and moon, storm and thunder-cloud, and all other natural phenomena, were credited with personal life and will. But that mythology had certainly advanced beyond the crude primitive form and entered the heroic stage, wherein the powers of nature were half human, half divine. Their language had passed into the inflective, or highest stage, and had undergone such changes that the relationship between its several groups and their origin from one mother-tongue were obscured and remained so until laid bare in our day. In short, the Aryan tribes had attained no mean state of civilization, some being more advanced than the others, according as external circumstances helped or hindered, and, one by one, they passed from the condition of semi-civilized nomads to become fathers and founders of nations that abide to this day.

These being the facts to which language itself bears witness, how was it possible for their mythologies, *i.e.*, their stock of notions about things, to remain unaffected and secure of transmission without organic change? The myths, unfixed in literary form, yielded themselves with ease as vehicles of new ideas; their ancient meaning, already faded, paled before the all-absorbing significance of present facts. These were more potent realities than the kisses of the dawn; the human and the personal, in its struggles of mightier interest than the battle of rosy morn or purple eve with the sons of thunder; and Homer's music would long since have died away were Achilles' "baneful wrath" but a passively told tale of the sun's grief for the loss of the morning.

In brief, the complex and varying influences which have transformed the primitive myth, are the important factors which the solar theorists have omitted in their attempted solution of the problem. They have forgotten the part which, to borrow a term from astronomy, "personal equation" has played. They have not examined myth in the light of the history of the race; and the new elements which it took into itself, while never wholly ridding itself of the old, have escaped them. They have secured a mechanical unity whereas, by combination of the historical with their own method, they might have secured a vital unity.

To all which classic myth itself bears record. The Greeks were of Aryan stock, but when they arrived in Europe is unknown. The period between their settlement and the Homeric age was, however, long enough to admit of their advance to the state of a nation rejoicing in the fulness of intellectual life. They remembered not from what rock they were hewn, from what pit they were digged. The nature-gods of their remote ancestors had long since changed their meteorological character and appeared in the likeness of men—or, at least played very human pranks on Olympus. In the Veda, the primitive-nature myth, although exalted and purified, is persistent; under one name or another it is still the ceaseless battle between the darkness and the light; Dyaus was still the bright sky, the cattle of Siva were still the clouds. But the Greek of Homer's time and his congener in the far north, had forgotten all that; the war in heaven was transferred to the strife of gods and men on the shores of the Hellespont and by the bleak seaboard of the Baltic. Their gods and goddesses, improved by age and experience, put off their physical and put on the ethical; the Heaven-father became king of gods and men, source of order, law and justice; the sun and the dawn, Apollo and Athênê, became wisdom, skill, and guardianship incarnate. And the story of human vicissitudes found in solar myth that "pattern of things in the heavens" which conformed to its design. Thus Homer, in whose day the old nature-myth had become confused with the vague traditions of veritable deeds of kings and heroes but dimly remembered, touched it as with heavenly fire unquenchable. The siege of Troy, so say the solar mythologists, "is a repetition of the daily siege of the east by the solar powers that every evening are robbed of their highest treasures in the west." It is surely with a truer instinct that while we contend for that physical origin of the great epics to which their remarkable agreement witnesses, we also feel that the vitality which inheres in them is due to whatever of human experience, joy, and sorrow are the burden of their immortal song. As to the repulsive features of Greek myth, one can neither share the distress of the solar theorists nor feel their difficulties. Both are self-created, and are aggravated by the assumption of "periods of temporary insanity through which the human mind had to pass," as the rude health of childhood is checked by whooping-cough and measles. They are explained by the persistence with which the lower out of which man has emerged asserts itself, as primary rocks pierce through and overlap later strata. The ancestors of the Aryans were savages in the remote past, and the "old Adam" was never entirely cast out; indeed, it is with us still. There are superstitions and credulities in our midst, in drawing-rooms as well as gypsy camps, quite as gross in nature, if less coarse in guise, as those extant among the Greeks. The future historian of our time, as he turns over the piles of our newspapers, will find contrasts of ignorance and culture in our midst as startling as any existing in the land of Homer, of Archimedes, and Aristotle. Spirit-rapping and belief in the "evil eye" have their cult among us, although Professor Huxley's "Hume" can be bought for two shillings, and knowledge has free course. And it certainly accords best with all that we have learnt as to the mode of human progress to believe that the old lived into the new, than that the old had been cast out, but had gained re-entry, making the last state of the Greeks to be worse than the first.

In this matter the Vedic hymns do not help us much. They are the products of a relatively highly-civilized time; the conception of sky and dawn as living persons has passed out of its primitive simplicity; these heavenly powers have become complex deities; there is much confounding of persons—the same god called by one or many names. The thought is that of an age when moral problems have presented themselves for solution and the references to social matters indicate a settled state of things far removed from the fisher and the hunter stage. Nevertheless, there lurk within these sacred writings survivals of the lower culture, traces of coarse rites, bloody sacrifices, of repulsive myths of the gods, and of cosmogonies familiar to the student of barbaric myth and legend.

Enough has been said to show that the extreme and one-sided interpretations of the solar theorists are due to a one-sided method. The philological method has yielded splendid results; this they have done; the historical yields results equally rich and fertile; this they have left undone. Language has given us the key to the kinship between the several members of the great body of Aryan myths; the study of the historical evolution of myths, the comparison of these, without

regard to affinity of speech, will give us the key to the kinship between savage interpretation of phenomena all the world over. The mythology of Greek and Bushman, of Kaffir and Scandinavian, of the Red Man and the Hindu, springs from the like mental condition. It is the uniform and necessary product of the human mind in the childhood of the race.

VII.

THE STARS IN MYTHOLOGY.

"REVENONS à nos moutons," as the impatient client who had lost some sheep reminded his rambling advocate.

In the great body of nature-myth, the stars are prominent members. In their multitude; their sublime repose in upper calms above the turmoil of the elements; their varying brilliancy, "one star differing from another star in glory"; their tremulous light; their scattered positions, which lend themselves to every vagary of the constellation maker; their slow procession, varied only by sweeping comet and meteor, or falling showers of shooting stars; they lead the imagination into gentler ways than do the vaster bodies of the most ancient heavens. Nor, although we may compute their number, weigh their volume, in a few instances reckon their distance, and, capturing the light that has come beating through space for unnumbered years, make it reveal the secret of their structure, is the imagination less moved by the clear heavens at night, or the feeling of awe and reverence blunted before that "mighty sum of things forever speaking."

In barbaric myth the stars are spoken of as the children of the sun and moon, but more often as men who have lived on the earth, translated without seeing death. The single stars are individual chiefs or heroes; the constellations are groups of men or animals. To the natives of Australia the brilliant Jupiter is a chief among the others, and the stars in Orion's belt and scabbard are young men dancing a corroboree, the Pleiades being girls playing to them. The Kasirs of Bengal say that the stars are men who climbed to the top of a tree, and were left in the branches by the trunk being cut away. To the Eskimos the stars in Orion are seal-hunters who have missed their way home; and in German folk-lore they are spoken of as the mowers, because, as Grimm says, "they stand in a row, like mowers in a meadow." In North American myth two of the bright stars are twins who have left a home where they were harshly treated, and leaped into the sky, whither their parents followed them, and ceaselessly chase them. In Greek myth the faintest star of the seven Pleiades is Merope, whose light was dimmed because she alone among her sisters married a mortal. In German star-lore, the small star just above the middle one in the shaft of Charles's Wain, is a wagoner who, having given our Saviour a lift, was offered the kingdom of heaven for his reward, but who said he would sooner be driving from east to west to all eternity, and whose desire was granted—a curious contrast to the legend of the Wandering Jew, cursed to move unresting over the earth till the day of judgment, because he refused to let Jesus, weary with the weight of the cross, rest for a moment on his doorstep. The Housatonic Indians say that the stars in Charles's Wain are men hunting a bear, and that the chase lasts from spring to autumn, when the bear is wounded, and its dripping blood turns the leaves of the trees red. With this may be cited the myth that the red clouds at morn and eve are the blood of the slain in battle. In the Northern Lights, the Greenlanders see the spirits of the departed dancing, the brighter the flashes of the Aurora the greater the merriment; while the Dacotahs say of the meteors that they are spirits flying through the air.

Of the Milky Way—so called because Hêrê, indignant at the bantling Heraklês being put to her breast, spilt her milk along the sky (the solar mythologers say that the "red cow of evening passes during the night across the sky, scattering her milk"); the Ottowas say that it was caused by a turtle swimming along the bottom of the sky, and stirring up the mud. According to the Patagonians, it is the track along which the departed tribesmen hunt ostriches; in African myth it is some wood-ashes long ago thrown up into the sky by a girl, that her people might be able to see their way home at night; in Eastern myth, it is chaff dropped by a thief in his hurried flight.

But the idea of a land beyond the sky—be it the happy hunting-ground of the Indian, or the paradise of Islam, or the new Jerusalem of the Apocalypse—would not fail to be imagined, and in both the Milky Way and the Rainbow barbaric fancy sees the ladders and bridges whereby the departed pass from earth to heaven. So we

find in the lower and higher culture alike the beautiful conceptions of the *chemin des ames*, the Red man's road of the dead to their home in the sun; the ancient Roman path of, or to, the gods; the road of the birds, in Lithuanian myth, because the winged spirits flit thither to the free and happy land. In prosaic contrast to all this, it is curious to find among ourselves the Milky Way described as Watling Street! That famous road, which ran from Richborough through Canterbury and London to Chester, now gives its name to a narrow, bustling street of Manchester warehousemen in the City. But who the Wætlingas were, and why their name was transferred from Britain to the sky,* we do not know, although the fact is plainly enough set down in old writers, foremost among whom is Chaucer. In his "House of Fame" † he says:—

> "Lo, there, quod he, cast up thine eye,
> se yonder, to, the galaxie,
> the whiche men clepe the Milky Way,
> for it is white, and some parfay
> ycallin it han Watlingestrete."

To the savage, the rainbow is a living monster, a serpent seeking whom it may devour, coming to earth to slake its unquenchable thirst, and preying on the unwary. But in more poetic myth, its mighty mani-colored arch touching, as it seems to do, the earth itself, is a road to glory. In the Edda it is the three-colored bridge Bifroset, the "quivering track" over which the gods walk, and of which the red is fire, so that the Frost-giants may not cross it. In Persian myth it is Chinvad, the "bridge of the gatherer," flung across the gloomy depths between this world and the home of the blessed; in Islam it is El-Sirat, the bridge thin as a hair and sharp as a scimitar, stretching from this world to the next; among the Greeks it was Iris, the messenger from Zeus to men, charged with tidings of war and tempest; to the Finns it was the bow of Tiernes, the god of thunder; whilst to the Jew it was the messenger of grace from the Eternal, who did set "his bow in the clouds" as the promise that never again should the world be destroyed by flood. Such belief in the heavens as the field of activities profoundly affecting the fortunes of mankind, and in the stars as influencing their destinies, has been persistent in the human mind. The delusions of the astrologer are embalmed in language, as when, forgetful of a belief shared not only by sober theologians, but by Tycho Brahe and Kepler, we speak of "disaster," of our friends as "jovial," "saturnine," or "mercurial." But the illusions of the savage or semi-civilized abide as an animating part of many a faith, undisturbed by a science which has swept the skies and found no angels there, and whose keen analysis separates forever the ancient belief in a connection between the planets and man's fate. For convenience' sake, we retain on our celestial maps and globes the men and monsters pictured by barbaric fancy in the star-positions and clusters noting these as interesting examples of survival. Yet we are the willing dupes of illusions nebulous as these, and, charm he never so wisely, the Time-Spirit fails to disenchant us.

If the sun and moon are the parents of the stars, the heavens and the earth are the parents of all living things. Of this widely-found myth, one of the most striking specimens occurs among the Maoris. From Rangi, the heaven, and Papa, the earth, sprang all living things; but earth and sky clave together, and darkness rested on them and their children, who debated whether they should rend them asunder or slay them. Then Tanemahuta, father of forests, reasoned that it was better to rend them so that the heaven might become a stranger, and the earth remain as their nursing-mother. One after another they strove to do this, but in vain, until Tanemahuta, with giant strength and strain, pressed down the earth and thrust upward the heaven. But one of his brothers, father of wind and storm, who had not agreed to this parting of his parents followed Rangi into the sky, and thence sent forth his progeny, "the mighty winds, the fierce squalls, the clouds dense and dark, wildly drifting, wildly hunting," himself rushing on his foe, snapping the huge trees that barred his path, and strewing their trunks and branches on the ground, while the sea was lashed into high-crested waves, and all the creatures therein affrighted. The fish darted hither and thither, but the reptiles fled into the forests, causing quarrel between Tangaron, the ocean-god, and Tane-mahuta for giving them shelter. So the brothers fought, the ocean-god wrecking the canoes and sweeping houses and trees beneath the waters, and had not Papa hidden the gods of the tilled food and the wild within her bosom, they would have perished. Wars of revenge

* Perhaps the converse is true; if the name was a totem which the family adopted, and which was given, as tribute to an important clan, to one of the main roads of this island.

† II., 427.

followed quickly one upon the other; the storm-god's anger was not soon appeased; so that the devastation of the earth was well-nigh complete. But, at last, light arose, and quiet ensued, and the dry land appeared. Rangi and Papa, parted for ever, quarreled no more, but helped the one the other, and "man stood erect and unbroken on his mother Earth."

VIII.

MYTHS OF THE DESTRUCTIVE FORCES OF NATURE.

THE beliefs of the ancient Finns in the world as a divided egg, of which the white is the ocean, the yolk the earth, and the arched shell the sky, and of the Polynesians that the universe is the hollow of a vast cocoanut shell, at the tapering bottom of which is the root of all things, are to us so grotesque that it is not easy to regard them as explanations seriously invented by the human mind. Yet these, together with the notions of the two halves of the shell of Brahma's egg, and of the two calabashes which form the heaven and the earth in African myth, find their correspondences in the wide-spread conception of the overarching firmament as a hard and solid thing,* with holes (or windows †) to let the rain through, with gates through which angels descend,‡ or through which prophets peer into celestial mysteries; § a firmament outside which other people live, as instanced by the Polynesian term for strangers, "papalangi," or "heaven-bursters."

They are the less refined forms of myths which have held their ground from pre-scientific times till now, and the rude analogies of which are justified by the appearances of things as presented by the senses. Man's intellectual history is the history of his escape from the illusions of the senses, it is the slow and often reluctant discovery that nature is quite other than that which it seems to be. And this variance between appearances and realities remained hidden until the intellect challenged the report about phenomena which the sense-perceptions brought. For in the ages when feeling was dominant, and the judgment scarce awakened, the simple explanations in venerable legends sung by bard or told by aged crone—legends to which age had given sanctity which finally placed them among the world's sacred literatures—were received without doubt or question. But, as belief in causality spread, men were not content to rest in the naïve explanations of an uncritical age. What man had guessed about nature gave place to what nature had to say about herself, and with the classifying of experience science had its birth.

Meanwhile, until this quite recent stage in man's progress was reached, the senses told their blundering tale of an earth flat and fixed, with sun, moon, and stars as its ministering servants, while gods or beasts upbore it, and mighty pillars supported the massive firmament. In Hindoo myth the tortoise which upholds the earth rests upon an elephant, whose legs *reach all the way down!* In Bogotà the culture-god Bochica punishes a lesser and offending deity by compelling him to sustain the part of Atlas, and it is in shifting his burden from shoulder to shoulder that earthquakes are caused. The natives of Celebes say that they are due to the world-supporting Hog as he rubs himself against a tree; the Thascaltecs that they occur when the deities who hold up the world relieve one another; the Japanese think that they are caused by huge whales creeping underground, an idea probably confirmed by the discovery of monster fossil bones.

As the myths about earth-bearers prevail in the regions of earthquakes, so do those about subterranean beings in the neighborhood of volcanoes. The superstitions which mountainous countries especially foster are intensified when the mountains themselves cast forth their awful and devastating progeny, "red ruin" and the other children born of them. Man in his dread, "caring in no wise for the external world, except as it influenced his own destiny; honoring the lightning because it could strike him, the sea because it could drown him,"* could do naught else than people them with maleficent beings, and conceive of their sulphur-exhaling mouths as the jaws of a bottomless pit.

Indeed, if in freeing ourselves from the tyranny of the "solar" theory we

* "And said the gods, let there be a hammered plate in the midst of the waters, and let it be dividing between waters and waters." Gen. i. 6. The verb from which the substantive is derived signifies, among other meanings, "to beat out into thin plates."

† Gen. viii. 2. ‡ Gen. xxviii. 17.

§ Ezekiel i. 1.

* "Modern Painters," Vol. III., 154.

shackled ourselves with some other, we should certainly prefer that which is known as the "meteorological," and which, in the person of Kuhn and other supporters, finds a more rational and persistent source of myth in phenomena which are fitful and startling, such as hurricane and tempest, earthquake and volcanic outburst. Sunrises and sunsets happen with a regularity which failed to excite any strong emotion or stimulate curiosity, and the remotest ancestor of the primitive Aryan soon shook off the habit—if, indeed, he ever acquired it—of going to bed in fear and trembling lest the sun should not come back again. Nature, in her softer aspects and her gracious bounties—in the spring-time, with its promise, the summer with its glory, the autumn with its gifts—has moved the heart of man to song and festival and procession; as, by contrast, the frost that nipped the early buds and the fierce heat that withered the approaching harvest gave occasion for plaintive ditty and somber ceremony. It is in the fierce play and passionate outburst of the elements, in the storm, the lightning, and the thunder, that the feelings are aroused and that the terror-stricken fancy sees the strife of wrathful deities or depicts their dire work among men. Hence, all the world over, the Storm-God and the Wind-God have played a mighty part.

To the savage, the wind, blowing as it listeth, its whence and whither unknown, itself invisible, yet the sweep and force of its power manifest and felt, must have ranked among the most striking phenomena. And, as will be seen hereafter, the correspondences between wind and breath and the connection between breath and life, added their quota of mystery in man's effort to account for the impalpable element. In the legends of the Quiches, the mysterious creative power is Hurakan (whence *hurricane*); among the Choctaws the original word for Deity is Hushtoli, the storm wind, and in Peru to kiss the air was the commonest and simplest sign of adoration to the collective divinities. The Guayacuans of South America, when a storm arose and there was much thunder or wind, all went out in troops, as it were to battle, shaking their clubs in the air, shooting flights of arrows in that direction whence the storm came.* But we are some steps nearer to the primitive myth when we find the wind conceived of as a mighty bird—which, indeed, is in both old and new world mythology a common symbol of thunder and lightning also. On this matter Dr. Brinton's remarks bear quoting:—

> Like the wind, the bird sweeps through the aërial spaces, sings in the forests, and rustles on its course; like the cloud, it floats in mid-air, and casts its shadow on the earth; like the lightning, it darts from heaven to earth to strike its unsuspecting prey. These tropes were truths to savage nations, and led on by that law of language which forced them to conceive everything as animate or inanimate, itself the product of a deeper law of thought which urges us to ascribe life to whatever has motion, they found no animal so appropriate for their purpose here as the bird. Therefore the Algonkins say that birds always make the winds, that they create the waterspouts, and that the clouds are the spreading and agitation of their wings; the Navajos, that at each cardinal point stands a white swan, who is the spirit of the blasts; so, also, the Dakotas frequently explain the thunder as the sound of the cloud-bird flapping his wings; the lightning as the fire that flashes from his tracks, like the sparks which the buffalo scatters when he scours over a stony plain.

Turning to the literatures of higher races, we find in the prose Edda, when Gangler asks whence comes the wind, that Har answers him: "Thou must know that at the northernmost point in the heavens sits a giant,

> "In the guise of an eagle;
> And the winds, it is said,
> Rush down on the earth
> From his outspreading pinions."

In the Veda, the Maruts, or Storm-gods, to whom many of the hymns are addressed, "make the rocks to tremble and tear asunder the kings of the forest," like Hermes in his violence and like Boreas in his rage. Whether or no they become in Scandinavian legend the grim and fearful Ogres swiftly sailing in their cloud-ships, we may see in them the "crushers" and "grinders,"* as their name imports, the types of northern deities like Odin, long degraded into the Wild Huntsman and his phantom crew, whose uncouth yells the peasant hears in the midnight air.

Of this personification of the elements, the following Ojibway folk-tale, cited by Dorman, gives poetic illustration:—"There were spirits from all parts of the country. Some came with crashing steps

* Dorman's "Primitive Superstitions," p. 350.

* From Sans. *mar*, "to grind." Ares and Mars come from the same root.

and roaring voice, who directed the whirlwinds which were in the habit of raging about the neighboring country. Then glided in gently a sweet little spirit, which blew the summer gale. Then came in the old sand-spirit, who blew the sand-squalls in the sand-buttes toward the west. He was a great speech-maker, and shook the lodge with his deep-throated voice, as he addressed the spirits of the cataracts and waterfalls, and those of the islands who wore beautiful green blankets."

In his valuable book on the Myths of the Red Race, Dr. Brinton has brought together a mass of evidence in support of a theory that the sanctity in which the number Four is held among that people is due to the adoration of the cardinal points, which are identified with the four winds, who, in hero myths, are the four ancestors of the human race. Certainly the illustrations with which the argument is supported are both numerous and valuable; but any elaborate system of mythology based upon a definite number of winds has, like the solar theory, to make the facts square with it, and while it explains much, to leave much unexplained. Here this bare reference to it must suffice.

Estimates differ much as to the size of the Thunder-Bird. In one tradition, an Indian found its nest, and secured a feather which was above two hundred feet long, while in another tradition the bird is said to be no bigger than one's little finger! But among the Western Indians he is an immense eagle. "When this aërial monster flaps his wings, loud peals of thunder roll over the prairie; when he winks his eye it lightens; when he wags his tail the waters of the lake which he carries on his back overflow and produce rain." The old and universal belief that stones were hurled by the Thunder-God is not so far-fetched as we, in our pride of science, might think, for the flints which are mistaken for thunderbolts, and which become objects of adoration as well as charms, produce a flash when struck by the lightning. Mixcoatl, the Mexican Cloud-serpent, as well as Jove, carries his bundle of arrows or thunderbolts, which in the hand of Thor are represented by his mighty club or hammer.

As in the conflict raging in the sky during gale or tempest, when the light and the darkness alternately prevail, the barbaric mind sees war waged between the heroes of the spirit-land who have carried their unsettled blood-feuds thither, so in many myths the lightning is no comrade of the thunder, but its foe, the battle of bird with serpent. The resemblances of the lightning flash to the sharp, sudden, zigzag movements of a creature so mysterious, to barbaric man, in its unlikeness to the beasts of the field, account for the myth, the interest of which lies for us in the correspondences which it suggests with the group of storm-myths and sun-myths of the Aryan race, the battle between Indra and Vritra, Ormuzd and Ahriman, Thor and Midgard, Hercules and Cacus, Apollo and Python, and St. George and the Dragon. It is with the physical origin and, for us, deep theological significance of these, that the succeeding paper will deal.

IX.

THE HINDU SUN-AND-CLOUD MYTH.

THESE papers would not be worth the reader's attention if they were solely concerned with bringing together illustrations of myths from semi-savage races. Their other, and indeed their primary, concern is with the origin and growth of man's effort to understand the nature and meaning of things around him, and of his own acts and feelings. In this lies primitive philosophy, theology, and science, the beginnings of all knowledge that has been and that ever will be, and in the unbroken sequence of which we find the explanation of the existence of beliefs among us which are discredited whenever examined. It is the persistence of these which has made it increasingly difficult, as these papers proceed, to deal with the primitive myth apart from its later and more serious forms. Myth was the product of man's emotion and imagination, acted upon by his surroundings, and it carries the traces of its origin in its more developed forms, as the ancestral history of the higher organisms is embodied in their embryos. Man wondered before he reasoned. Awe and fear are quick to express themselves in rudimentary worship; hence the myth was at the outset a theology, and the gradations from personifying to deifying are too faint to be traced. Thus blended, the one as inevitable outcome of the other, they cannot well be treated separately, as if the myth was earth-born and the theology heaven-sent. And to treat them as one is to invade no province of religion,

which is quite other than speculation about gods. The awe and reverence which the fathomless mystery of the universe awakens, which steal within us unbidden as the morning light, and unbroken on the prism of analysis; the conviction, deepening as we peer, that there is a Power beyond humanity, and upon which humanity depends; the feeling that life is in harmony with the Divine order when it moves in disinterested service of our kind—these theology can neither create nor destroy, neither verify nor disprove. They can be bound within no formula that man or church has invented, but undefined—

"Are yet the fountain life of all our day,
Are yet a master light of all our seeing."

If thus far my readers are with me as to the unrelation between religion and formulated theology, and if these papers have shown with any clearness the emergence of the latter from primitive speculations about the gods and their doings, their sympathetic interest may be reckoned on in what has now to follow concerning the survival of some old weather-myths in beliefs that have had profound and direful influence upon human conduct and fate.

All the Aryan nations have among their legends, often exalted into epic themes, the story of a battle between a hero and a monster. In each case the hero conquers, and releases treasures, or in some way renders succor to man, through his victory. In Hindu myth this battle is fought between Indra and Vritra.

Indra, one of the Vedic gods, comes, according to Professor Max Müller, from the same root as the Sanskrit *indu*, drop, sap, but the etymology is doubtful. What is not doubtful is that he is the god of the bright sky, and, although like the other gods invoked in the hymns of the Rig-Veda, a departmental or tribal deity, a sort of *primus inter pares*, of whose many titles, Vritrahan, or "Vritraslayer," is the pre-eminent one. The benefits showered by him upon mortals caused the attribution of moral qualities to him, and he was adored as "lord of the virtues," while the juice of the sacred soma plant was offered in his honor, for which reason he is also called Somapâ, or "soma-drinker." It is his struggle with Vritra which is a constant theme of the Vedic hymns, the burden of which remind us of the praises offered in the Psalms to Yahweh as a man of war, as mighty in battle. "The gods do not reach thee, nor man, thou overcomest all creatures in strength. . . . Thou, thunderer, hast shattered with thy bolt the broad and massive cloud into fragments, and hast sent down the waters that were confined in it to flow at will; verily thou alone possessest all power." The primitive physical meaning of the myth is clear. Indra is the sun-god, armed with spears and arrows, for such did the solar rays appear to barbaric fancy. The rain-clouds are imprisoned in dungeons or caverns by Vritra, the "enveloper," the thief, serpent, wolf, wild boar as he is severally styled in the Rig-Veda. Indra attacks him, hurls his darts at him; they pierce the cloud-caverns, the waters are released, and drop upon the earth as rain.

Surely a most rational explanation; self-consistent as fitting into crude philosophy of personal life and volition in sun and cloud, and fraught with deep truth of meaning in regions like the Punjaub, where drought brought famine in its train.

The Aryans were a pastoral people, their wealth being in flocks and herds.* The cow yielded milk for the household; her dung fertilized the soil; her young multiplied the wealth of the family at an ever-increasing rate, and she naturally became the symbol of fruitfulness and prosperity, ultimately an object of veneration; while, for the functions which the bull performed, he was the type of strength. The Aryan's enemy was he who stole or injured the cattle; the Aryan's friend was he who saved them from the robber's clutch.

Intellectually, the Aryan tribes were in the mythopœic stage, and the personification of phenomena was rife among them. Their barbaric fancy, as kindred myths all the world over testify, would find ample play in the fleeting and varied scenery of the cloud-flecked heavens, suggestive, as this would be, of bodies celestial and bodies terrestrial. To these children of the plain the heavens were a vast, wide expanse, over which roamed supramundane beasts, the two most prominent figures in their mythical zoology being the cow and the bull. The sun, giver of blessed light, was the bull of majesty and strength; the white clouds were cows, from whose swelling udders dropped the milk of heaven—the blessed rain. But there were dark clouds also, clouds of night and clouds of storm, and within these lurked the monster rob-

* Both "pecuniary" and "fee" are, as established by Grimm's law, from *pecu*. Lat. *pecu-a*, pl. *pecus*, "cattle"; Sansk. *paçu*, "cattle" from *pac*, to fasten (that which is tied up, *i.e.*, domestic cattle). Cf. Skeats's Etymol. Dict. *in loc.*

ber; into them he lured the herds, and withheld both light and rain from the children of men. To the sun-god, therefore, who smote the thief-dragon, Vritra, with his shaft, and set free the imprisoned cows, went up the shout of praise, the song of gratitude. This myth, as hinted already, survives, in many legends of the Aryan race, and their family likeness is unmistakable. In its Latin guise, it appears as Hercules* and Cacus, although the preciseness of detail narrated by Virgil, Livy, and other writers, has given it quasi-historical rank. Hercules, after his victory over Geryon, stops to rest by the Tiber, and while he is sleeping the three-headed monster, Cacus, steals some of his cattle, dragging them by their tails into his cavern in Mons Avertinus. Their bellowing awakens Hercules, who attacks the cavern, from the mouth of which Cacus vomits flames, and roars as in thunder. But the hero slays him and frees the cattle, a victory which the earlier Romans celebrated with solemn rites at the Ara Maxima. In Greek myth the most familiar examples are the struggles between the sun-god, Apollo, and the storm-dragon, Python, and the deliverance of the Princess Andromeda by Perseus from the sea-monster sent by Poseidon to ravage the land. In the northern group we have the battle of Siegfried with the Niflungs, or Niblungs, and of Sigurd with the dragon of Fafnir, who guards golden treasures; while, in the Eddor, Thor goes fishing with the giant Hymir, and, baiting his hook with a bull's head, catches the great serpent Midgard. Among ourselves, Beowulf, hero of the poem of that name, attacks Grendel, the grim and terrible Jotun that haunts a marsh by the German Ocean (the watery habitat of these monsters is a noticeable common feature), and carries off young and old alike, so that the land is desolated. With mighty grip Beowulf tears him limb from limb, and when, later on, another "winged worm," devourer of fair damsels and hoarder of stolen riches, appears, Beowulf slays him with his enchanted sword.

These brief illustrations would hardly be complete without some reference to our national saint. Opinions differ as to his merits, Gibbon stigmatizing him as a fraudulent army contractor,† while the researches of M. Ganneau seek to establish his relation to the Egyptian Horus and Typhon. Be this as it may, the stirring old legend tells how George of Cappadocia delivered the city of Silene from a dragon dwelling in a lake hard by. Nothing that the people could give him satisfied his insatiate maw, and in their despair they cast lots who among their dearest ones should be flung to the dread beast. The lot fell to the king's daughter and she went unflinchingly, like Jephthah's daughter, to her fate. But on the road the hero learns her sad errand, and bidding her fear not, he, making sign of the cross, brandishes his lance, attacks and transfixes the dragon, and leading him into Silene, beheads him in sight of all the people, who, with their king, are baptized to the glory of Him who made Saint George the victor.*

While, however, the myth of Indra and Vritra has in its Western variants remained for the most part a battle between heroes and dragons, the moral element rarely or never obscuring the undoubted physical features, it gave rise among the Iranians, or ancient Persians, to a definite theology, the strange fortunes of which have profoundly affected Christendom. How this came about needs another paper to tell.

X.

DEMONOLOGY.

ALTHOUGH in the Vedic hymns the features of the primitive nature-myth reappear again and again, Indra himself boasting, "I slew Vritra, O Maruts, with might, having grown strong with my own vigor; I who hold the thunderbolt in my arms, I have made these all-brilliant waters to flow freely for man," we find an approach in them to some conception of that spiritual conflict of which the physical conflict was so complete a symbol. Indra, as victor, is an object of adoration and invested with purity and goodness; Vritra, as the enemy of men, is an object of dread, and invested with malice and evil.

But while in the Zend-Avesta, the Scriptures of the old Iranian religion, the struggle between Thraetaôna and the three-headed serpent Azhi-Dahâka (in which names are recognizable the Traitana and Ahi of the Veda and the Feri-

* Not the same as the Greek Herakles. The similarity of name led the Romans to identify their Hercules, who was a god of boundaries, like Jupiter Terminus, with the Greek hero. *Cacus* is not cognate with Gr. *kakos*, bad, but was originally *Caecius*, the "blinder" or "darkener."

† "Decline and Fall," vol. iii., c. xxiii., 171. (Smith's Ed.).

* See Ralston's "Russian Folk-Tales," p. 347, for similar Bulgarian legend about St. George.

dum and Zohak of Persian epic) is narrated, the normal idea is dominant throughout. The theme is not the attack of the sun-god to recover stolen milch cows from the dragon's cave, but the battle between Ormuzd, the Spirit of Light, and Ahriman, the Spirit of Darkness. The one seeks to mar the earth which the other has made. Into the fair paradise, Airayana-Vaêjô, "a delightful spot," as the Avesta calls it, "with good waters and trees," and into other smiling lands which Ormuzd has blessed, Ahriman sends "a mighty serpent strong, deadly frost buzzing insects, and poisonous plants. . . . toil and poverty," and, worse than all, "the curse of unbelief."* Between these two spiritual powers and their armies of good and bad angels the battle rages for supremacy in the universe for possession of the citadel of Mansoul.

Early in the history of the Aryan tribes there had arisen a quarrel between the Brahminic and Iranian divisions. The latter had become a quiet-loving, agricultural people, while the former remained marauding nomads, attacking and harassing their neighbors. In their plundering inroads they invoked the aid of spells and sacrifices, offering the sacred soma-juice to their gods, and nerving themselves for the fray by deep draughts of the intoxicating stuff. Not only they, but their gods as well, thereby became objects of hatred to the peaceful Iranians, who forswore all worship of freebooters' deities, and transformed these *devas* of the old religion into demons. That religion, as common to the Indo-European race, was polytheistic, a worship of deities each ruling over some department of nature, but a worship exalting now one, now another god, be it Indra, or Varuna, or Agni, according to the indications of the deity's supremacy, or according to the mood of the worshiper. As remarked by Jacob Grimm, "the idea of the devil is foreign to all primitive religions," obviously because in all primitive thought evil and good are alike regarded as the work of deities. In the Old Testament, Yahweh is spoken of as the author of both;† the angels, whether charged with weal or woe, are his messengers. In the "Iliad," Zeus dispenses both:—

"Two urns by Jove's high throne have ever stood.
The source of evil one, the other good;
From thence the cup of mortal man he fills,
Blessings to these, to those distributes ills,
To most, he mingles both."*

and 'tis a far way from this to the loftier conception of Euripides: "If the gods do evil, then are they no gods." So there was a monotheistic—or, as Prof. Max Müller terms it, a henotheistic—element in the Vedic religion which in the Iranian religion, and this mainly through the teaching of the great thinker and reformer, Zarathushtra (Zoroaster), was largely diffused. In his endeavor to solve the old problem of reconciling sin and misery with Omnipotent goodness, he supposes "two primeval causes," one of which produced the "reality," or good mind; the other the "non-reality," or evil mind. Behind these was developed belief in a philosophical abstraction, "uncreate time," of which each was the product; but such doctrines were too subtle for the popular grasp, and, wrapped in the old mythological garb, they appeared in concrete form as dualism. Vritra survived in Ahriman, who, like him, is represented as a serpent; and in Ormuzd we have the phonetic descendant of Ahura-mazdas.

Now, it was with this dualism, this transformed survival of the sun and cloud myth, that the Jews came into association during their memorable exile in Babylon. Prior to that time, their theology, as hinted above, had no devil in it. But in that belief in spirits which they held in common with all semi-civilized races, as a heritage from barbarous ancestors, there were the elements out of which such a personality might be readily evolved. Their *satan*, or "accuser," as that word means, is no prince of the demons, like the Beelzebub of later times; no dragon, or old serpent, as of the Apocalypse, defying Omnipotence and deceiving the whole world; but a kind of detective who, by direction of Yahweh, has his eye on suspects, and who is sent to test their fidelity. In all his missions he acts as the intelligent and loyal servant of Yahweh. But although therefore not regarded as bad himself the character and functions with which he was credited made easy the transition, from such theories about him to theories of him as inherently evil, as the enemy of goodness, and, therefore, of God. He who, like Vritra, was an object of dread, came to be regarded as the incarnation of evil, the author and abetter of things harmful to man. Persian dualism gave concrete form to this

* Haig's "Essays on the Parsis," tr. Vendidâd, pp. 225, ff.

† Cf. Isaiah xlv. 7; 1 Kings xxii. 21–23; Amos iii. 6.

* "Iliad," Book xxiv. p. 663, ff.

conception, and from the time of the Exile we find Satan as the Jewish Ahriman, the antagonist of God. Not he alone, for "the angels that kept not their first estate" were the creatures of his evil designs, creatures so numerous that "every one has 10,000 at his right hand and 1000 at his left hand, and because they rule chiefly at night no man should greet another lest he should salute a demon. They haunt lonely spots, often assume the shape of beasts, and it is their presence in the bodies of men and women which is the cause of madness and other diseases." *

From the period when the Apocryphal books, especially those having traces of Persian influence, were written,† this doctrine of an archfiend with his army of demons received increasing impetus. It passed on without check into the Christian religion, and wherever this spread the heathen gods, like the *devas* of Brahminism among the Iranians, were degraded into demons, and swelled the vast crowd of evil spirits let loose to torment and ruin mankind.

This doctrine of demonology, it should be remembered, was but the elaborated form of that ancestral belief in spirits referred to above. In the Christian system it was associated with that belief in magic which has its roots in fetishism, and from the two arose belief in witchcraft. The universal belief in demons in early and mediæval times supplied an easy explanation of disasters and diseases; the sorcerers and charm-workers, the wizards and enchanters, had passed into the service of the devil. For power to work their spite and malevolence, they had bartered their souls to him, and sealed the bargain with their blood. It was enough for the ignorant and frightened sufferers to accuse some poor, misshapen, squinting old woman of casting on them the evil eye, or of appearing in the form of a cat, to secure her trial by torture and her condemnation to an unpitied death. The spread of popular terror led to the issue of Papal bulls and to the passing of statutes in England and in other countries against witchcraft, and it was not until late in the eighteenth century that the laws against that imaginary crime were repealed.

There is no sadder chapter in the annals of this tearful world, than this ghastly story of witch-finding and witch-burning. Sprenger computes that during the Christian epoch no less than *nine millions* of persons, mostly women of the poorer classes, were burned; victims of the survival into relatively civilized times of an illusion which had its source in primitive thought. It was an illusion which had the authority of Scripture on its side; * the Church had no hesitation concerning it, such men as Luther, Sir Thomas Browne, and Wesley never doubted it, the evidence of the bewitched was supported by honest witnesses, and judges disposed to mercy and humanity had no qualms in passing the dread sentence of the law on the condemned.†

And although it exists not to-day, save in by-places where gross darkness lurks, it was not destroyed by argument, by disproof, by direct assault, but only through the growth of the scientific spirit, before which, like the miasma of the Campagna before the planting of the Eucalyptus, it has dispersed. It could not live in an atmosphere thus purified, an atmosphere charged with belief in unchanging causation, and in a definite order unbroken by caprice or fitfulness, whether in the sweep of a planet or the pulsations of a human heart.

Of course the antecedents of the archfiend himself could not fail to be the subject of curious inquiry in the time when his existence was no matter of doubt. The old theologians scraped together enough material about him from the sacred books of the Jews and Christians to construct an elaborate biography of him; but in this they would seem to have explained too much in certain directions and not enough in others, thus provoking a reaction which ultimately discredited their painful research. Their genealogy of him was carried further back than they intended or desired, for the popular notions credited him with both a mother and grandmother. Their theory of his fall from Heaven gave rise to the droll conception of his lameness and to the legends of which the "devil on two sticks" is a type. Their infusion of foreign element into his nature aided his pictorial presentment in motley form and garb. To Vedic descriptions of Vritra's darkness may perchance be traced his murkiness and blackness; Greek satyr and German forest-sprite his goat-like body,

* Vide my "Jesus of Nazareth," p. 144.

† Notably "Tobit" and "Baruch," and cf. "Book of Wisdom," II. 24, for earliest indications of the belief. The Asmodeus of Tobit iii. 8 and 17, appears to be the Aeshmô dârvô of the Zend-Avesta.

* Exodus xxii. 18.

† For details of witch trials in this island, cf. Mrs. Lynn Linton's "Witch Stories," *passim*.

his horns, his cloven hoofs, his tail; to Thor his red beard and trident, vulgarized into a pitchfork; to dwarfs and goblins his red cloak and nodding plume; to theories of transformation of men and spirits into animals his manifold metamorphoses, as black cat, wolf, hellhound, and the like.

But his description was his doom; it was by a natural sequence that the legends of mediæval times present him, not, with the Scotch theologians, as a scholar and a swindler, disguising himself as a parson, but as gullible and stupid, as overreaching himself, and as befooled by mortals. And, like the Trolls of Scandinavian folk-lore who burst at sunrise, it needed only the full light thrown upon his origin and development by the researches of comparative mythologists to dissipate this creation of man's fears and fancies into the vaporous atmosphere where he had his birth.

XI.

METEMPSYCHOSIS AND TRANSFORMATION.

THE belief that human beings could change themselves into animals was alluded to in my remarks on witchcraft, but, in view of its large place in the history of illusions, too incidentally, and it is proposed to give it further reference here.

Superstitions which now excite a smile, or which seem beneath notice, were no sudden phenomena, appearing now and again at the beck and call of willful deceivers of their kind. That they survive at all, like organisms, atrophied or degenerate, which have seen "better days," is evidence of remote antiquity and persistence. Every seeming vagary of the mind had serious importance, and answered to some real need of man as a sober attempt to read the riddle of the earth and get to its inmost secret.

So with this belief. It is the outcome of that early thought of man which conceived a common nature and fellowship between himself and brutes, a conception based on rude analogies between his own and other forms of life, as also between himself and things without life, but having motion, be they waterspouts or rivers, trees or clouds, especially these last, when the wind, in violent surging and with howling voice, drove them across the sky. Where he blindly, timidly groped, we walk as in the light, and with love that casts out fear. Where rough resemblances suggested to him like mental states and actions in man and brute, the science of our time has, under the comparative method, converted the guess into a certainty; not to the confirmation of his conclusions, but to the proof of identity of structure and function, to the demonstrating of a common origin, however now impassable the chasm that separates us from the lower animals.

The belief in man's power to change his form and nature is obviously nearly connected with the widespread doctrine of metempsychosis, or the passing of the soul at death into one or a series of animals, generally types of the dead man's character, as where the timid enter the body of a hare, the gluttonous that of a swine or vulture.

"Fills with fresh energy another form,
And towers an elephant or glides a worm;
Swims as an eagle in the eye of noon;
Or wails a screech-owl to the deaf, cold moon, [and glare,
Or haunts the brakes where serpents hiss
Or hums, a glittering insect, in the air."

But while in transmigration the soul returns not to the body which it had left, transformation was only for a time, occurring at stated periods, and effected by the will of the transformed, or by the aid of sorcery and magic, or sometimes imposed by the gods as a punishment for impious defiance and sin.

Other causes, less remote, aided the spread of a belief to which the mind was already inclined. Among these were the hallucinations of men who believed themselves changed into beasts, and who, retreating to caves and forests, issued thence howling and foaming, ravening for blood and slaughter; hallucinations which afflicted not only single persons, as in the case of Nebuchadnezzar, whose milder monomania (he, himself, saying in the famous prize poem:—

"As he ate the unaccustomed food,
It may be wholesome, but it is not good.")

rather resembled that of the daughters of Prætus, who believed themselves cows, but which also spread as virulent epidemic among whole classes. It is related that, in 1600, multitudes were attacked by the disease known as lycanthropy, or wolf-madness (from Greek, *lukos*, a wolf, and *anthropos*, a man), and that they herded and hunted in packs, destroying and eating children, and keeping in their mount-

ain fastnesses a cannibal or devil's Sabbath, like the nocturnal meetings of witches and demons known as the Witches' Sabbath. Hundreds of them were executed on their own confession, but some time elapsed before the frightful epidemic, and the panic which it caused, passed away. Besides such delusions, history down to our own time records instances where a morbid, innate craving for blood, leading sometimes to cannibalism, has shown itself. Mr. Baring-Gould, in his "Book of Werewolves," cites a case from Gall of a Dutch priest who had such a desire to kill and to see killed that he became chaplain to a regiment for the sake of witnessing the slaughter in battle. But still more ghastly are the notorious cases of Elizabeth, an Hungarian lady of title, who inveigled girls into her castle and murdered them that she might bathe her body in human blood to enhance her beauty; and of the Maréchal de Retz who, cursed with the abnormal desire to murder children, allured them with promises of dainties into his kitchen, and killed them, inhaling the odor of their blood with delight, and then burned their bodies in the huge fireplace in the one room devoted to these horrors. When the deed was done, the Maréchal would lie prostrate with grief "would toss weeping and praying on a bed, or recite fervent prayers and litanies on his knees, only to rise with irresistible craving to repeat the crime."

Such instances as the foregoing, whether of delusion or morbid desire to destroy, are among secondary causes; they may contribute, but they do not create, being inadequate to account for the world-wide existence of transformation myths. The animals which are the supposed subject of these vary with the habitat but are always those which have inspired most dread from their ferocity. In Abyssinia we find the man-hyæna; in South Africa, the man-lion; in India, the man-tiger; in Northern Europe, the man-bear; and in other parts of Europe the man-wolf or were-wolf (from A.-S. *wer*, a man).

Among the many survivals of primitive thought in the Greek mythology, which are the only key to its coarser features, this of belief in transformation occurs, and, indeed, along the whole line of human development it appears and re-appears in forms more or less vivid and tragic. The gods of the South, as of the North, came down in the likeness of beasts and birds, as well as of men, and among the references to these myths in classic writers, Ovid, in the "Metamorphoses," tells the story of Zeus visiting Lykaon, king of Arcadia, who placed a dish of human flesh before the god to test thereby his omniscience. Zeus detected the trick, and punished the king by changing him into a wolf, so that his desire might be toward the food which he had impiously offered to his god.

"In vain he attempted to speak; from that very instant
His jaws were bespluttered with foam, and only he thirsted
For blood, as he raged among flocks and panted for slaughter.
His vesture was changed into hair, his limbs became crooked.
A wolf—he retains yet large traces of his ancient expression,
Hoary he is as afore, his countenance rabid,
His eyes glitter savagely still, the picture of fury."

But we may pass from this and such-like tales of the ancients to the grim realities of the belief in mediæval times.

XII.

TRANSFORMATION IN THE MIDDLE AGES.

THE closing remarks in my last paper made reference to the terribly real form which belief in transformation assumed in the middle ages.

If wolves abounded, much more did the were-wolf abound. According to Olaus Magnus, the sufferings which the inhabitants of Prussia and neighboring nations endured from wolves were trivial compared with the ravages wrought by men turned into wolves. On the feast of the Nativity, these monsters were said to assemble and then disperse in companies to kill and plunder. Attacking lonely houses, they devoured all the human beings and every other animal found therein. "They burst into the beer-cellars and there they empty the tuns of beer or mead, and pile up the empty casks one above another in the middle of the cellar, thus showing their difference from natural wolves." In Scandinavia it was believed that some men had a second skin, out of which they could slip and appear in the shape of a beast. Perhaps the phrase "to jump out of one's skin" is a relic of this notion. The Romans believed that the were-wolf simply effected the change

by turning his skin inside out, hence the term "versipellis," or "skin-changer." So in mediæval times it was said that the wolf's skin was under the human, and the unhappy suspects were hacked and tortured for signs of such hairy growth. Sometimes the change was induced, it is said, by putting on a girdle of human skin round the waist; sometimes by the use of magical ointment. Whatever the animal whose shape a man took could do, that he could do, plus such power as he possessed in virtue of his manhood or acquired by sorcery, his eyes remaining as the only features by which he could be recognized. If he was not changed himself, some charm was wrought on the eyes of onlookers whereby they could see him only in the shape which he was supposed to assume. The genuine monomaniacs aided such an illusion. The poor demented one who conceived himself a dog or a wolf, who barked, and snapped, and foamed at the mouth, and bit savagely at the flesh of others, was soon clothed by a terror-stricken fancy in the skin of either brute, and believed to have the canine or lupine appetite in addition to his human cunning. The imagination thus projects in visible form the specters of its creation; the eye in this, as in so much else, sees the thing for which it looks. Some solid foundation for the belief would, however, exist in the custom among warriors of dressing themselves in the skins of beasts to add to their ferocious appearance. And it was amid such that the remarkable form of mania in Northern Europe known as the Berserkr rage ("bear-sark" or "bear-skin" wearer) arose. Working themselves by the aid of strong drink or drugs and contagious excitement into a frenzy, these freebooters of the Northland sallied forth to break the back bones and cleave the skulls of quiet folk and unwary travelers. As with flashing eyes and foaming mouth they yelled and danced, seemingly endowed with magic power to resist assault by sword or club, they aroused in the hysterically disposed a like madness, which led to terrible crimes, and which died away only as the killing of one's fellows became less the business of life.

During the fifteenth and sixteenth centuries, the belief in men-beasts reached its maximum, and met with no tender treatment at the hands of a Church whose Founder had manifested such soothing pity toward the "possessed" of Galilee and Judæa. That Church had a cut-and-dried explanation of the whole thing, and applied a sharp and pitiless remedy. If the devil, with countless myrmidons at his command, was "going to and fro in the earth, and walking up and down in it," what limit could be put to his ingenuity and arts? Could he not as easily change a man into a wolf or a bear, as a woman into a cat; and had not each secured this by a compact with him, the foe of God and His Church? The evidence in support of the one was as clear and cogent as in support of the other; hence were-wolf hunting and burning became as Christian a duty and as paying a profession as witch-smelling and torturing. Any cruelty was justified by its perpetrators when the object in view was the vindication of the majesty of God; and not until the advancing intelligence of men recoiled against the popular explanations of witchcraft and lycanthropy were the laws against both repealed.

Those explanations were survivals of savage mental philosophy blended with a crude theology. To the savage, all diseases are the work of evil spirits. If a man hurts himself against a stone, the demon in the stone is the cause. If the man falls suddenly ill, writhes or shrieks in his pain, the spirit which has smuggled itself in with the food or the drink or the breath is twisting or tearing him; if he has a fit, the spirit has flung him; if he is in the frenzy of hysteria, the spirit within him is laughing in fiendish glee. And when the man suddenly loses his reason, goes, as people say, "out of his mind," acts and looks no longer like his former self, still more does this seem the work of an evil agent within him. It is kindred with the old belief that the sickly and ugly infant had been left in the cradle by the witch in place of the child which she had stolen before its baptism.* And the thing to do is to find some mode of conjuring or frightening or forcing the demon out of the man just as it became a sacred duty to watch over the newly born until the sign of the Cross had been made on its forehead, and the regenerating water sprinkled over it.

"Presbyter is but old priest writ large." And the theory of demoniacal agency was but the savage theory in a more elaborate guise. To theologians and jurists it was a sufficing explanation; it fitted in with the current notions of the government of the universe, and there was no

* Spenser says:—
"Such, men do *changelings* call, so changed by fairies' theft."

need to frame any other. Body and mind were to them as separate entities, as they are to the savage and the ignorant. Each regarded the soul as independent of the body, and framed his theories of occasional absence therefrom accordingly. But science has taught us to know ourselves not as dual, but as one. She lays her finger on the subtle, intricate framework of man's nervous system, and finds in the derangement of this the secret of those delusions and illusions which have been so prolific in agony and suffering. She makes clear how the yielding to morbid tendencies can still foster delusions, which, if no longer the subject of pains and penalties in the body politic, are themselves ministers of vengeance in the body where they arise. And in the recognition of a fundamental unity between the physical and the mental, in the healthy working of the one as dependent on the wholesome care of the other, she finds not only the remedy against mental derangement and all forms of harmful excitement, but also the prevention which is better than cure.

XIII.

THE BELIEF IN TRANSFORMATION UNIVERSAL.

TRADITIONS of transformation of men into beasts are not confined to the Old World. In Dr. Rink's "Tales of the Eskimo" there are numerous stories both of men and women who have assumed animal form at will, as also incidental references to the belief in stories such as that telling how an Eskimo got inside a walrus skin, so that he might lead the life of that creature. And among the Red Races, that rough analogy which led to the animal being credited with life and consciousness akin to the human, still expresses itself in thought and act. If even now it is matter of popular belief in the wilds of Norway that Finns and Lapps, who from remote times have passed as skillful witches and wizards, can at pleasure assume the shape of bears, the common saying, according to Dr. Dasent, about an unusually daring and savage beast being, "that can be no Christian bear," we may not be surprised that lower races still ascribe power of interchange to man and brute. The werewolf superstition is extant among the North-Western Indians, but free from those diabolical features which characterized it in mediæval times among ourselves. It takes its place in barbaric myth generally, and although it may have repellant or cruel elements, it was never blended with belief in the demoniacal. The Ahts say that men go into the mountains to seek their manitou (that is, the personal deity, generally the first animal seen by the native in the dream produced by his fasting on reaching manhood), and, mixing with wolves, are after a time changed into these creatures. Although the illustration bears more upon what has to be said concerning the barbaric belief in animal ances tors, it has some reference to the matter in hand to cite the custom among the Tonkanays, a wild and unruly tribe in Texas, of celebrating their origin by a grand annual dance. One of them, naked as he was born, is buried in the earth, then the others, clothed in wolfskins, walk over him, sniff around him, howl in wolfish style, and then dig him up with their nails. The leading wolf solemnly places a bow and arrow in his hands, and, to his inquiry as to what he must do for a living, advises him "to do as the wolves do—rob, kill, and rove from place to place, never cultivating the soil." Dr. Brinton, in quoting the above from Schoolcraft, refers to a similar custom among the ancient dwellers on Mount Soracte.

As in past times among ourselves, so in times present among races such as the foregoing, their wizards and shamans are believed to have power to turn themselves as they choose into beasts, birds, or reptiles. By whatever name these professional impostors are known, whether as medicine-men, or, as in Cherokee, by the high-sounding title of "possessors of the divine fire," they have traded, and wherever credulity or darkest ignorance abide, still trade, on the fears and fancies of their fellows by disguising themselves in voice and gait and covering as the animal which they pretend to be. Among races believing in transformation such tricks have free course, and the more dexterous the sorcerer who could play bear's antics in a bear's skin proved himself in throwing off the disguise and appearing suddenly as a man, the greater his success, and he more firmly grounded the belief.

The whole subject, although presented here only in the barest outline, would not be fitly dismissed without some reference to the survival of the primitive belief in men-animals in the world-wide stories known as Beast-fables, in which animals act and talk like human beings. When

to us all Nature was wonderland, and among our playfellows were the four-footed, the birds, and the fishes; when in fireside tale and rhyme they spoke our language and lived that free life which we then shared and can never share again, the feeling of kinship to which the old fables gave expression may have checked mady a wanton act, and, if we learned it not fully then, at least have taken the lesson to heart since,

> Never to blend our pleasure or our pride
> With sorrow of the meanest thing that lives.

And then those "Fables" of Æsop, even with the tedious drawback of the "moral," as powder beneath the jam, did they not lighten for us in school-days the dark passages through our Valpy (for the omniscient Dr. William Smith was not then the tyro's dread), and again give us communion with the fowl of the air and the beast of the field? Now, our mature thought may interest itself in following the beast-myths to the source whence Babrius and Phædrus, knowing not its springhead and antiquity, drew their vivid presentments of the living world, and find in the storied East the wellspring that fed the imagination of youngsters thousands of years ago. With some authorities the Egyptians have the credit of first inventing the beast-fable, but among them, as among every other advanced race, such stories are the remains of an earlier deposit; relics of a primitive philosophy, in which wisdom, and skill, and cunning are no monopoly of man's. The fondness of the negro races, whose traditions are not limited to South and Central Africa, for such fables is well known, as witness the tales of which "Uncle Remus" is a type, and it is strikingly illustrated in the history of the Vai tribe, who having, partly through contact with whites elaborated a system of writing, made the beast-fable their earliest essay in composition.*

In former papers, the evidence in support of the common ancestry of the languages spoken by the leading peoples in Europe, and by such important historical races in Asia as the Hindu and the Persian, has been summarized. That evidence is likewise conclusive, not only as to the origin of the myths on which the great Indo-European epics are founded, but also as to the possession by the several clans of a common stock of folk-lore and folk-tale, in which, of course, the beast-fable is included, these being the relics in didactic or humorous guise of that serious philosophy concerning the life of man and beast among the barbaric ancestors of the Indo-Europeans, upon which stress enough has been laid.

Even if the common origin could be disproved, the evidence would merely be shifted from local to general foundations, because the uniform attitude of mind before the same phenomena would be proven; but the resemblances are too minute in detail to be explained by a theory of independent creation of the tales where now we find then. The likenesses are many; the unlikenesses are few, being the result of local coloring, historical fact blended with the fiction, popular belief, and superstition, all affected by the skill of the professional story-teller. As in the numerous variants of the familiar Cinderella, Beauty and the Beast, Punchkin, and the like, the same fairy prince or princess, the same wicked magician and clever, versatile Boots peep through, disclosing the near relationship of Hindu nursery tales to the folk-tales of Norway and the Highlands, of Iceland and Ceylon, of Persia and Serbia, of Russia and the lands washed by the Mediterranean. In the venerable collection of "Buddhist Birth Stories," now in course of translation by Dr. Rhys Davids,* and to which he has prefaced an interesting introduction on the source and migration of folk-tales, we are face to face with many a fable familiar to us in the "Æsop" of our school-days. There is the story of the Ass in the Lion's Skin, not in which, as Æsop has it, the beast dressed himself, but which the hawker put on him to frighten the thieves who would steal his goods. Left one day to browse in a field while his master refreshed himself at an inn, some watchmen saw him, and, raising hue and cry, brought out the villagers, armed with their rude implements. The ass, fearing death, made a noise like an ass, and was killed. Long might he, adds the ancient moral,

> Clad in a lion's skin
> Have fed on the barley green;
> But he brayed!
> And that moment he came to ruin.

The variants of this old fable are found in mediæval, in French, German, Indian, and Turkish folk-lore, as are also those of the tortoise who lost his life through

* Cf. Mahaffy's "Prolegomena to Ancient History," p. 292.

* Vol. I. Trübner & Co. See also, for some valuable illustrations from early English and other sources, an article by Rev. Dr. Morris, in *Contemp Rev.*, May, 1881.

"much speaking." Desiring to emigrate, two ducks agreed to carry him, he seizing hold of a stick which they held between their beaks. As they passed over a village, the people shouted and jeered, whereupon the irate tortoise retorted, "What business is it of yours?" and, of course, thereby let go the stick and, falling down, split in two. Therefore

> Speak wise words not out of season;
> You see how, by talking overmuch,
> The tortoise fell."

In Æsop, the tortoise asks an eagle to teach him to fly; in Chinese folk-lore he is carried by geese.

Jacob Grimm's researches concerning the famous mediæval fable of "Reynard the Fox," revealed the ancient and scattered materials out of which that wonderful satire was woven, and there is no feature of the story which reappears more often in Eastern and Western folk-lore than that cunning of the animal which has been for the lampooner and the satirist the type of self-seeking monk and ecclesiastic. When Chanticleer proudly takes an airing with his family, he meets master Reynard, who tells him he has become a "religious," and shows him his beads, and his missal, and his hair shirt, adding in a voice "that was childlike and bland," that he had vowed never to eat flesh. Then he went off singing his Credo, and slunk behind a hawthorn. Chanticleer, thus thrown off his guard, continues his airing, and the astute hypocrite, darting from his ambush, seizes the plump hen Coppel. So in Indian folk-tale, a wolf living near the Ganges is cut off from food by the surrounding water. He decides to keep holy day, and the god Sakka, knowing his lupine weakness, resolves to have some fun with him, and turns himself into a wild goat. "Aha!" says the wolf, "I'll keep the fast another day," and springing up he tried to seize the goat, who skipped about so that he couldn't be taken. So Lupus gives it up, and says as his solatium: "After all, I've not broken my vow."

The Chinese have a story of a tiger who desired to eat a fox, but the latter claimed exemption as being superior to the other animals, adding that if the tiger doubted his word, he could easily judge for himself. So the two set forth, and, of course, every animal fled at sight of the tiger, who, too stupid to see how he had been gulled, conceived high respect for the fox, and spared his life.

Sometimes the tables are turned. Chanticleer gets his head out of Reynard's mouth by making him answer the farmer, and in the valuable collection of Hottentot tales which the late Dr. Bleek, with some warrant, called "Reynard in South Africa," the cock makes the jackal say his prayers, and flies off while the outwitted beast folds his hands and shuts his eyes.

But I must forbear quoting further. Enough if it is made clear to the reader that the beast-fable is the lineal descendant of barbaric conceptions of a life shared in common by man and brute, and another link thus added to the lengthening chain of the continuity of human history.

XIV.

BEAST-FABLES.

THE beast-fables cited in my last paper were drawn from widely-severed sources, as illustrative of ideas common to all barbarous races, concerning the community of life in man and brute.

They are thus shown to embalm the relics of a serious philosophy, and the like is true of the great mass of folk-tales of which they are a branch. The connection of the two is, indeed, manifest in the group of which "Beauty and the Beast" is a well-known example, in which the husband or wife is of fair human form by night and a hideous monster by day, until freed from the sorcerer's enchantment. Such tales have not fallen in the East to the low level which they have reached here, because they yet accord in some degree with extant superstitions in India, whereas in Europe they find little or nothing to which they correspond. But, dismissing these, we will deal with a group of stories culled from various collections, the leading idea of which is the dwelling apart of the soul or heart, as the seat of life, from the body, in some secret place, as in an egg, or a necklace, or a flower; the destruction of the soul involving that of the body.

In the Norse tale of "The giant who had no heart in his body," the monster turns six princes and their wives into stone, whereupon the seventh and only surviving son, Boots, sets out to avenge their fate. On his journey he saves the lives of a raven, a salmon, and a wolf, and the wolf, having eaten his horse, compensates Boots by carrying him to the giant's castle, where the lovely princess who is

to be his bride is confined. She promises to find out where the giant keeps his heart, and by blandishments and divers arts known to the fair sex both before and since the time of Delilah, she worms out the secret. He tells her that "far, far, away in a lake lies an island; on that island stands a church; in that church is a well; in that well swims a duck; in that duck is an egg; and in that egg there lies my heart, you darling!" Boots, taking fond farewell of the princess, rides on the wolf's back to the island. Then the raven he had befriended flies to the steeple and fetches the key of the church; the salmon, in like return for kindness, brings him the egg from the well where the duck had dropped it.

Then the wolf told him to squeeze the egg, and as soon as ever he did so, the giant screamed out. "Squeeze it again," said the wolf; and when the prince did so, the giant screamed still more piteously, and begged and prayed so prettily to be spared, saying he would do all that the prince wished if he would only not squeeze his heart in two. "Tell him if he will restore to life again your six brothers and their brides, you will spare his life," said the wolf. Yes, the giant was ready to do that, and he turned the six brothers into kings' sons again, and their brides into kings' daughters. "Now squeeze the egg in two," said the wolf. With questionable morality, doing evil that good might come, Boots squeezed the egg to pieces, and the giant burst at once.

Some interesting variants of this story are given by Mr. Ralston in his "Russian Folk-Tales," in which Koshchei is the counterpart of the giant, his death being brought about by the destruction of the object in which his soul is hidden. In one story he is killed by a blow on the forehead inflicted by the mysterious egg—that last link in the magic chain by which his life is darkly bound. In another version the fatal blow is struck by a small stone found in the yolk of an egg, which is inside a duck, which is inside a hare, which is inside a stone, which is on an island. In another variant, Koshchei attempts to deceive his fair captive, pretending that his "death" resides in a besom, or in a fence, both of which she adorns with gold in token of her love. Then he confesses that his "death" really lies in an egg, inside a duck, inside a log which is floating on the sea. Prince Ivan gets hold of the egg, and shifts it from one hand to the other. Koshchei rushes wildly from side to side of the room. At last the prince breaks the egg, and Koshchei falls on the floor and dies.

In Serbian folk-tale the strength of a baleful being who had stolen a princess lies in a bird which is inside the heart of a fox, and when the bird was taken out of the heart and set on fire, that moment the wife stealer falls down dead, and the prince regains his bride. In Bohemian, Gaelic, Greek, Finnish, as also among the Hottentot and Samoyed folk-tales, the same incident occurs of an external soul, generally hidden in an egg, the breaking of which ends the life of giant or other monster. In the "Arabian Nights" the Jinni's soul is enclosed in the crop of a sparrow, and the sparrow is imprisoned in a small box, and this again in seven other boxes, which are put into seven chests, contained in a coffer of marble, which is sunk in the ocean that surrounds the world. Seyfel-Mulook raises the coffer by the aid of Suleyman's seal-ring, and having extricated the sparrow, strangles it, whereupon the Jinni's body is converted into a heap of black ashes.

The most venerable form in which we possess the myth of a man's soul outside his body comes to us from the valley of the Nile, but before narrating this we must seek in the "storied East" the close parallels to the folk-lore of the Western Aryans. As in the Rig-Veda we are in certain respects nearer to the older forms of the parent language of the Indo-European peoples, so in the folk-tales of Bengal and the Deccan we are nearer the earliest forms of the fireside stories of both east and west.

In the story of "Punchkin" given in Miss Frere's "Old Deccan Days," a Rajah has seven daughters, and his wife dying when they were quite children, he marries the widow of his prime minister. Her cruelty to his children made them run off to a jungle, where seven neighboring princes, who were out hunting, found them, and each took one of them to wife. After a time they again went hunting, and did not come back. So when the son of the youngest princess, who had also been enchanted away, grew up, he set out in search of his mother and father and uncles, and at last discovered that the seven princes had been turned into stone by the magician Punchkin, who had shut up the princess in a tower because she would not marry him. Recognizing her son, she plotted with him to feign agreement to marry Punchkin if he would tell her where the secret of his life was hidden. Overjoyed at her yielding to his wish, the magician told her that it was true that he was not as others.

Far, far away, hundreds of thousands of miles from this, there lies a desolate country covered with thick jungle. In the midst of the jungle grows a circle of palm-trees, and in the center of the circle stand six chattees full of water, piled one above another; below the sixth chattee is a small cage which contains a little green parrot; on the life of the parrot depends my life, and if the parrot is killed I must die. But, he added, this was not possible, because thousands of genii "surround the palm-trees, and kill all who approach the place."

The princess told her son this, and he set forth on his journey. On the way he rescued some young eagles from a serpent, and the grateful birds carried him until they reached the jungle, where, the genii being overcome with sleep by the heat, the eaglets swooped down. "Down jumped the prince; in an instant he had overthrown the chattees full of water and seized the parrot, which he rolled up in his cloak," then mounted again into the air and was carried back to Punchkin's palace. Punchkin was dismayed to see the parrot in the prince's hands, and asked him to name any price he willed for it, whereupon the prince demanded the restoration of his father and his uncles to life. This was done; then he insisted on Punchkin doing the like to "all whom he had thus imprisoned," when, at the waving of the magician's wand, the whole garden became suddenly alive.

"Give me my parrot!" cried Punchkin. Then the boy took hold of the parrot, and tore off one of his wings; and as he did so the magician's right arm fell off. He then pulled off the parrot's second wing, and Punchkin's left arm fell off; then he pulled off the bird's legs, and down fell the magician's right leg and left leg. Nothing remained of him save the limbless body and the head; but still he rolled his eyes, and cried, "Give me my parrot!" "Take your parrot, then," cried the boy, and with that he wrung the bird's neck, and threw it at the magician, and as he did so, Punchkin's head twisted round, and, with a fearful groan he died. Of course, all the rest "lived very happily ever afterward," as they do in the plays and the novels.

In the story of "Sodewa Bai," the Hindu Cinderella, the heroine's soul is contained in a string of golden beads, and in the Bengali tale, "Life's Secret," a Rajah's favorite wife gives birth miraculously to a boy, whose soul is bound up in a necklace in the stomach of a boal-fish. In both instances the jewels are stolen, and while they are worn by the thieves, prince and princess alike are lifeless, while with the recovery of the jewels, life returned to each.

The family likeness of these Indian folk-tales to those given above is explicable on no theory of borrowing, and finds its sole and rational explanation in the possession of a common stock of folk-lore by the several ancestors of the Indo-European races. As Sir G. W. Cox remarks, "the substantial identity of stories told in Italy, Norway, and India can but prove that the treasure-house of mythology was more abundantly filled before the dispersion of the Aryan tribes than we had taken it to be."

The Egyptian tale of the "Two Brothers" is of great value on account of its high antiquity, and, moreover, specially interesting as recording an incident similar to that narrated in the life of Joseph. It is contained in the d'Orbiney papyrus preserved in the Bibliothèque Impériale, the date being about the fourteenth or fifteenth century B.C.

There were two brothers, Anepou and Satou, joined as one in love and labor. One day Satou was sent to fetch seed-corn from Anepou's house, where he found his brother's wife adorning her hair. She urged him to stay with her, but he refused, promising, however, to keep her wickedness secret. When Anepou returned at even, she, being afraid, "made herself to seem as a woman that had suffered violence," and told him exactly the reverse of what had happened. Anepou's wrath was kindled against Satou, and he went out to slay him; but Satou called on Phra to save him, and the god placed a river between the brothers, so that when day dawned Anepou might hear the truth. At sunrise Satou tells his story, and, mutilating himself, he says that he will leave Anepou and go to the valley of the cedar, in the cones of which he will deposit his heart, "so that if the tree be cut, his heart would fall to the earth, and he must die."

Space forbids further outline of the venerable story, which finally ends with the reconciliation of the two brothers.

For us the value of these folk-tales lies in the relics of barbaric notions concerning the nature of man and his relation to external things which they preserve. They have amused our youthhood: they may instruct our manhood. Not if we go to the solar mythologist for their interpretation. We shall learn from Sir G. W. Cox that "the magician Punchkin and the heartless giant are only other forms

of the Panis who steal bright treasures from the gleaming west," that "Balna herself is Helen shut up in Ilion . . . the eagles the bright clouds," * and from Professor de Gubernatis that the duck is the dawn and the egg the sun.

These venerable tales have a larger, richer meaning than this, expressive of the wonder deep-seated in the heart of man. Like the beautiful prisms of topaz and beryl revealed when a "drusy" cavity in granitic rock is broken open, they hold within them the crystallized thought of the past. The soul existing apart from the body, whether in bird or casket, and determining its fate, is the relic of barbaric belief in one or more entities *in* the body, yet not *of* it—a belief extant among tribes still uncivilized, and surviving in unsuspected forms among more advanced races.

XV.

TOTEMISM.

In addition to the beliefs in the transformation of men into animals and in the transmigration of souls into the bodies of animals, we find among barbarous peoples a belief which is probably the parent of one and certainly nearly related to both, namely, in descent from the animal or plant, more often the former, whose name they bear. Its connection with transmigration is seen in the belief of the Moquis, an Indian tribe, that after death they live in the form of their totemic animal, those of the Deer family becoming deer, and so on through the several clans. The belief survives in its most primitive and vivid forms among two races, the aborigines of Australia and the North American Indians. The word "totemism," given to it both in its religious and social aspects, is derived from the Algonquin "dodaim" or "dodhaim," meaning "clanmark." Among the Australians, the word "kobong," meaning "friend" or "protector," is the generic term for the animal or plant by which they are known. It is akin in significance to the Indian words "manitou," "oki," etc., comprehending "the manifestations of the unseen world, yet conveying no sense of personal unity," which are commonly translated by the misleading word "medicine;" hence, "medicine-men."

The family name, or second name borne by all the tribes in lineal descent, and which corresponds to our surname, *i.e.*, *super nomen*, or "over-name," is derived from names of beasts, birds, etc., around which traditions of their transformation into men linger. Sir Geo. Grey * says that there is a mysterious connection between a native and his kobong. It is his protecting angel, like the "daimon" of Socrates, like the "genius" of the early Italian. "If it is an animal, he will not kill one of the species to which it belongs, should he find it asleep, and he always kills it reluctantly and never without affording it a chance of escape. The family belief is that some one individual of the species is their dearest friend, to kill whom would be a great crime," as, in Hindu belief, when a Rajah was said to have entered at death into the body of a fish, a "close time" was at once decreed. Among the Indian tribes we find well-nigh the whole fauna represented, their totem being the Bear, Turtle, Deer, Hawk, Eagle, Pike, Buffalo, etc. Like the Australians, these tribes regarded themselves as being of the breed of their particular animal-totem, and avoided hunting, slaying and eating (of which more presently) the creature under whose form the ancestor was thought to be manifest. The Chippaways carried their respect even further. Deriving their origin from the dog, they at one time refrained from employing their supposed canine ancestors in dragging their sledges. The Bechuana and other people of South Africa will avoid eating their tribe-animal or wearing its skin. The same prohibitions are found among tribes in Northern Asia, and the Vogulitzi of Siberia, when they have killed a bear, address it formally, maintaining "that the blame is to be laid on the arrows and iron, which were made and forged by the Russians!" Among the Delawares the Tortoise gens claimed supremacy over the others, because their ancestor, who had become a fabled monster in their mythology, bore their world on his back. The Californian Indians are in interesting agreement with Lord Monboddo when, in claiming descent from the prairie wolf, they account for the loss of their tails by the habit of sitting, which, in course of time, wore them down to the stump! The Kickapoos say their ancestors had tails, and that when they lost them the "impudent fox sent every morning to ask how their tails were, and the bear shook his fat sides at the joke."

* "Mythology of the Aryan Nations," Vol. I., p. 140, *n.*

* "Travels in N. W. and W. Australia," Vol. II., 229.

The Patagonians are said to have a number of animal deities, creators of the several tribes, some being of the caste of the guanaco, others of the ostrich, etc. In short, the group of beliefs and practices found among races in the lower stages of culture point to a widespread common attitude toward the mystery of life around them. In speaking of totemism among the Red Races, Dr. Brinton thinks that the free use of animate symbols to express abstract ideas, which he finds so frequent, is the source of a confusion which has led to their claiming literal descent from wild beasts. But the barbaric mind bristles with contradictions and mutually destructive conceptions; nothing is too wonderful, too *bizarre* for its acceptance, and the belief in actual animal descent is not the most remarkable or far-fetched among the articles of its creed.

The subject of totemism is full of interest both on its religious and social side:—

On its religious side it has given rise, or, if this be not conceded, impetus, to that worship of animals which assuredly had its source in the attribution of mysterious power through some spirit within them, making them deity incarnate.

On its social side it has led to prohibitions which are inwoven among the customs and prejudices of civilized communities. But before speaking of these prohibitions, the barbaric mode of reckoning descent should be noticed.

The family name borne by any Australian tribe is perpetuated by the children, whether boys or girls, taking their mother's name. Precisely the same custom is found among the American Indians—the children of both sexes being of the mother's clan. Now, the family, as we define it, does not exist in savage communities, nor, as Mr. McLennan says in his very remarkable work on "Primitive Marriage," had "the earliest human groups any idea of kinship, . . . the physical root of which could be discerned only through observation and reflection." Where the relations of the sexes were confused and promiscuous, the oldest system in which the idea of blood-ties was expressed was a system of kinship through the mother. The habits of the "much-married" primitive men made mistake about any one's mother less likely than mistake about his father; and, if in civilized times it is, as the saying goes, a wise child that knows its own father, he was, in barbarous times, a wise father who knew his own child. Examples tracing the kinship through females, father and offspring being never of the same clan, abound in both ancient and modern authorities, and perhaps the most amusing one that can be given is found in Dr. Morgan's "Systems of Consanguinity." He says that the "natives of the province of Keang-se are celebrated among the natives of the other Chinese provinces for the mode, or form, used by them in address, namely, 'Laon peaon,' which, freely translated, means, 'Oh, you old fellow, brother mine by some of the ramifications of female relationship!'"

The prohibitions arising out of totemism are two: 1. Against intermarriage between those of the same name or crest. 2. Against the eating of the totem by any member of the tribe called after it.

I. Among both Australians and Indians a man is forbidden to marry his own clan, *i.e.*, any woman of his own surname or badge, no matter where she was born or however distantly related to him.

Were this practice of "Exogamy," as marriage outside the tribe is called, limited to one or two places, it might be classed among exceptional local customs based on a tradition, say, of some heated blood-feud between the tribes. But its prevalence among savage or semi-savage races all the world over points to reasons the nature of which is still a *crux* to the anthropologists. The late Mr. McLennan, whose opinion on such a matter is entitled to the most weight, connects it with the custom of female infanticide, which, rendering women scarce, led at once to polyandry, or one female to several males, within the tribe, and to the capturing of women from other tribes. This last-named practice strengthens Mr. McLennan's theory. He cites numerous instances from past and present barbarous races, and traces its embodiment in formal code until we come to the mock relics of the custom in modern times—as, for example, that harmless "survival" in bride-lifting, that is, stealing, as in the word "cattle-lifting."

Connected with this custom is the equally prevailing one which forbids intercourse between relations, as especially between a couple and their fathers and mothers-in-law, and which also forbids mentioning their names. (I have, by the way, heard more than one cynical son-in-law express regret that certain features of this custom had not survived among ourselves.) So far as the aversion which the savage has to telling his own name, or uttering that of any person (especially the dead), or thing feared by him is concerned,

the reason is not far to seek. It lies in that confusion between names and things which marks all primitive thinking. The savage, who shrinks from having his likeness taken in the fear that a part of himself is being carried away thereby, regards his name as something through which he may be harmed. So he will use all sorts of roundabout phrases to avoid saying it, and even change it that he may elude his foes, and puzzle or cheat Death when he comes to look for him. But why a son-in-law should not see the face of his mother-in-law, for so it is among the Aranaks of South America, the Caribs and other tribes of more northern regions, the Fijians, Sumatrans, Dayaks, the natives of Australia, the Zulus, in brief, along the range of the lower culture, is a question to which no satisfactory answer has been given, and to which reference is here made because of its connection with totemism.

II. That the animal which is the totem of the tribe should not be eaten, even where men did not hesitate to eat their fellows, is a custom for which it is less hard to account. The division of flesh into two classes of forbidden and permitted, of clean and unclean, with the resulting artificial liking or repulsion for food which custom arising out of that division has brought about, is probably referable to old beliefs in the inherent sacredness of certain animals. The Indians of Charlotte Island never eat crows, because they believe in crow-ancestors, and they smear themselves with black paint in memory of that tradition; the Dacotahs would neither kill nor eat their totems, and if necessity compels these and like barbarians to break the law, the meal is preceded by profuse apologies and religious ceremonies over the slain. The abstention of the Brahmins from meat, the pseudo-revealed injunction to the Hebrews against certain flesh-foods (that against pork has its origin, it has been suggested, in the tradition of descent from a boar) need no detailing here. But, as parallels, some restrictions among the ancient dwellers in these islands are of value. It was, according to Cæsar,* a crime to eat the domestic fowl, or goose, or hare, and to this day the last-named is an object of disgust in certain parts of Russia and Brittany. The oldest Welsh laws contain several allusions to the magical character of the hare, which was thought to change its sex every month or year, and to be the companion of the witches, who often assumed its shape.* The revulsion against horse-flesh as food may have its origin in the sacredness of the white horses, which, as Tacitus remarks,† were kept by the Germans at the public cost in groves holy to the gods, whose secrets they knew, and whose decrees regarding mortals their neighings interpreted. That this animal was a clan-totem among our forefathers there can be no doubt, and the proofs are with us in the white horses carved in outline on the chalk hills of Berkshire and the west, as in the names and crests of clan descendants.

The survival of the totem in heraldry is worth more than a passing remark, and will have further reference in a succeeding chapter.

* "De Bell. Gall.," V., c. 12.

* Elton's "Origins of English History," p. 297.
† Germania, IX., 10.

XVI.

HERALDRY: ANCESTOR-WORSHIP.

AS we have seen, the totem is the clan-name indicating descent from a common ancestor. It is also the clan-symbol, badge, or crest. Where the tribes among whom it is found are still in the picture-writing stage, *i.e.*, when the idea is expressed by a portrait of the thing itself instead of by some sound-sign—a stage in writing corresponding to the primitive stage in language, when words were imitative—there we find the rude hieroglyphic of the totem a means of intercourse between different tribes, as well as with whites. A striking example of this is given in the sketch (Fig. 1), which is a copy of a petition sent by some Western Indian tribes to the United States Congress for the right to fish in certain small lakes near Lake Superior.

The bird represents the leading clan, the crane; then follow three martens, as totems of three tribes; then the bear, the man-fish, and the cat-fish, also totems. From the eye and heart of each of the animals runs a line connecting them with the eye and heart of the crane, to show that they are all of one mind, and the eye of the crane has also a line connecting it with the lakes on which the tribes have their eyes, and another line running toward Congress.

In the barbaric custom of painting or carving the totem on oars, on the bows and sides of canoes, on weapons, on pillars in the front of houses, and on the

houses themselves; in tattooing it on various parts of the body (in the latter case, in some instances, together with pictures of exploits; so that the man carries on his person an illustrated history of his own life) we have the remote and forgotten origin of heraldic emblems. The symbols of civilized nations, as, *e.g.*, the Imperial eagle, which so many states of ancient and modern renown have chosen; the crests of families of rank, with their fabulous monsters, as the cherub, the Greek *gryps*, surviving in the griffin, the dragon, the unicorn; which, born of rude fancy or terrified imagination, are now carved on the entrance-gates to the houses of the great; the armorial bearings on carriages; the crest engraven on ring or embossed on writing-paper, these are the lineal descendants of the totem; and the Indians, who could see no difference between their system of manitous and those of the white people, with their spread-eagle or their lion-rampant, made a shrewd guess that would not occur to many a *parvenu* applying at the Heralds's College for a crest. The continuity is traceable in the custom of the Mexicans and other civilized nations of painting the totemic animals on their banners, flags, crests, and other insignia; and it would seem that we have in the totem the key to the mystery of those huge animal-shaped mounds which abound on the North American continent.

The arbitrary selection in the "ages of chivalry" of such arms as pleased the knightly fancy, or ministered to its pride, or, as was often the case, resembled the name in sound, together with the ignorance then and till recently existing as to the origin of crests, and also the discredit into which a seemingly meaningless vanity had fallen, have made it difficult to trace the survival of the totem in the crests even of that numerous company of the Upper Ten who claim descent from warriors who came over with the Conqueror. But there is no doubt that an inquiry conducted on the lines suggested above, and not led into by-paths by false analogies, would yield matter of interest and value. It would add to the evidence of that common semicivilized stage out of which we have risen. Such names as the



FIG. 1.

Horsings, the Wylfings, the Derings, the Ravens, the Griffins, may hold within themselves traces of the totem name of the horse, wolf, deer, raven, and that "animal fantasticall," the griffin. In Scotland we find the clan Chattan, or the wild cat; in Ireland "the men of Osory were called by a name signifying the wild red deer." On the other hand such names may have been given merely as nicknames (*i.e.*, ekename, or the *added* name, from *eke*, "also," or "to augment"), suggested by the physical or mental likeness to the thing after which they are called.

But it is time to turn to the religious significance of the totem, as shown among races worshiping the animal which is their supposed ancestor.

At first glance this seems strong argument in support of Mr. Herbert Spencer's theory that all forms of religion (and all myth) have their origin in ancestor-worship. The mysterious power of stimulation, of excitation to frenzy, or of heal-

ing and soothing, or of poisoning, which certain plants possess, has been attributed to indwelling spirits, which, as Mr. Spencer contends, are regarded as human and ancestral. Very many illustrations of this occur, as, *e.g.*, the worship of the Soma plant, and its promotion as a deity among the Aryans; the use of tobacco in religious ceremonies among the tribes of both Americas; while now and again we find plants as totems. The Pueblos have a tribe called the tobacco-plant, and also one called the red grass. One of the Peruvian Incas was called after the native name of the tobacco-plant; and among the Ojibways the buffalo grass was carried as a charm, and its god said to cause madness. Its manlike character is seen in the accompanying picture (Fig. 2).



FIG. 2.

The worship of animals is on the like theory explained as due to the giving of a nick-name of some beast or bird to a remote ancestor, the belief arising in course of time that such animal was the actual progenitor, hence its worship. We call a man a bear, a pig, or a vampire, in symbolic phrase, and the figure of speech remains a figure of speech with us. But the savage loses the metaphor and it crystallizes into hard matter-of-fact. So the traditions have grown, and Black Eagle, Strong Buffalo, Big Owl, Tortoise, etc., take the shape of the actual forefathers of the tribe having their name and crest. According to the same theory, the adoration of sun, moon, and mountains, etc., is due to a like source. Some famous chief was called the Sun; the metaphor was forgotten; the personal and concrete, as the more easily apprehended, remained; hence, worship of the powers of nature "is a form of ancestor-worship, which has lost in a still greater degree the character of the original."*

The objection raised in former papers of this series to the extreme application of the solar theory applies, so it seems to me, with equal force to Mr. Spencer's limitation of the origin of myth and religion to one source. Having cleared Scylla, we must not dash against Charybdis. Religion has its origin neither in fear of ghosts, as Mr. Spencer's theory assumes, nor in a perception of the Infinite inherent in man, as Professor Max Müller holds. Rather does it lie in man's sense of vague wonder in the presence of powers whose force he cannot measure, and his expressions toward which are manifest. There is underlying unity, but there are, to quote St. Paul, "diversities of operation." There is just that surface unlikeness which we might expect from the different physical conditions and their resulting variety of subtle influences surrounding various races; influences shaping for them their gods, their upper and nether worlds; influences of climate and soil which made the hell of volcanic countries an abyss of sulphurous, stifling smoke and everlasting fire, and the hell of cold climates a place of deadly frost; which gave to the giant-gods of northern zones their rugged awfulness, and to the goddesses of the sunny south their soft and stately grace. The theory of ancestor-worship as the basis of every form of religion does not allow sufficient play for the vagaries in which the same thing will be dressed by the barbaric fear and fancy, nor for the imagination as a creative force in the primitive mind even at that lowest at which we know it. And of course beneath that lowest lies a lower never to be fathomed. We are apt to talk of primitive man as if his representatives were with us in the black fellows who are at the bottom of the scale, forgetting that during unnumbered ages he was a brute in everything but the capacity by which at last the ape and tiger were subdued within him, of the beginnings of his *thought* we can know nothing, but the fantastic forms in which it is first manifest compel us to regard him as a being whose feelings were uncurbed by reason. That ancestor-worship is one mode among others of man's attitude toward the awe-begetting, mystery-inspiring universe, none can deny. That his earliest temples, as defined sacred spots, were tombs; that he prayed to his dead dear ones, or his dead feared ones, as the case might be, is admitted. From its strong personal character, ancestor-worship was, without doubt, one of the earliest expressions of man's attitude before the world which his fancy filled with spirits. It

* "Principles of Sociology," p 413.

flourishes among barbarous races to-day; it was the prominent feature of the old Aryan religion; it has entered into Christian practice in the worship of the saints, and perhaps the only feature of religion which the modern Frenchman has retained is the *culte des morts*. That it was a part of the belief of the Emperor Napoleon III. the following extract from his will shows:—"We must remember that those we love look down upon us from heaven and protect us. It is the soul of my great-uncle which has always guided and supported me. Thus will it be with my son also if he proves worthy of his name.

But the worship of ancestors is not primal. The remarks in my former paper on the late recognition of kinship by savages, among whom some rude form of religion existed, tell against it as the earliest mode of worship. Moreover, nature is bigger than man, and this he was not slow to feel. Even if it be conceded that sun-myth and sun-worship once arose through the nick-naming of an ancestor as the Sun, we must take into account the force of that imagination which enabled the unconscious myth-maker, or creed-maker, to credit the moving orbs of heaven with personal life and will. The faculty which could do that might well express itself in awe-struck forms without intruding the ancestral ghost. Further, the records of the classic religions, themselves preserving many traces of a primitive nature-worship, point to an adoration of the greatness and bounty, as well as to a sense of the maleficent and fateful, in earth and heaven which seem prior to the more concrete worship of forefathers and chieftains.

If for the worship of these last we substitute a general worship of spirits, there seems little left on which to differ. As aid to the explanation of the belief in animal ancestors and their subsequent deification and worship, as of the lion, the bull, the serpent, etc., we have always present in the barbaric mind the tendency to credit living things, and indeed lifeless, but moving ones, with a passion, a will, and a power to help or harm immeasurably greater than man's. This is part and parcel of that belief in spirits everywhere, which is the key to savage philosophy, and the growth of which is fostered by such secondary causes as the worship of ancestors.

XVII.

SURVIVAL OF MYTH IN HISTORICAL NARRATIVES.

BEFORE bringing this series of papers to an end, it may be well to give an illustration or two of the survival of myth in historical narrative.

For proofs of the emergence of the higher out of the lower in philosophy and religion, to say nothing of less exalted matters, whether the beast-fable or the nursery rhyme as holding barbaric thought in solution, examples have necessarily been drawn from the mythology of past and present savage races. But these are too remote in time or standpoint to stir other than a languid interest in the reader's mind; their purpose is served when they are cited and classified as specimens. Not thus is it with examples drawn nearer home from sources at which our young thirst for the stirring and romantic was slaked. When we learn that famous names and striking episodes are in some instances only transformed and personified natural phenomena, or, as occurring everywhere, possibly variants of a common legend, the far-reaching influence of primitive thought comes to us in more vivid and exciting form. And although one takes in hand this work of disenchantment in no eager fashion, the loss is more seeming than real. Whether the particular tale of bravery, of selflessness, of faithfulness, has truth of detail, matters little compared with the fact that its reception the wide world over witnesses to human belief, even at low levels, in the qualities which have given man empire over himself and ever raised the moral standard of the race. Moreover, in times like these, when criticism is testing without fear or favor the trustworthiness of records of the past, whether of Jew or Gentile, the knowledge of the legendary origin of events woven into sober history prepares us to recognize how the imagination has fed the stream of tradition, itself no mean tributary of that larger stream of history, the purity of which is now subject of analysis. As a familiar and interesting example let us take the story of William Tell.

Everybody has heard how, in the year 1307 (or, as some say, 1296) Gessler, Vogt (or governor) of the Emperor Albert of Hapsburg, set a hat on a pole as symbol of the Imperial power, and ordered every one who passed by to do obeisance to it; and how a mountaineer named Wilhelm Tell, who hated Gessler and the tyranny

which the symbol expressed, passed by without saluting the hat, and was at once seized and brought before Gessler, who ordered that, as punishment, Tell should shoot an apple off the head of his own son. As resistance was vain, the apple was placed on the boy's head, when Tell bent his bow, and the arrow, piercing the apple, fell with it to the ground. Gessler saw that Tell, before shooting, had stuck a second arrow in his belt, and, asking the reason, received this for answer: "It was for you; had I shot my child, know that this would have pierced your heart."

Now, this story first occurs in the chronicle of Melchior Russ, who wrote at the end of the fifteenth century, *i.e.*, about one hundred and seventy years after its reputed occurrence. The absence of any reference to it in contemporary records caused doubt to be thrown upon it three centuries ago. Guillimann, the author of a work on Swiss Antiquities, published in 1598, calls it a fable, but subscribes to the current belief in it, because the tale is so popular! The race to which he belonged is not yet extinct. A century and a half later, a more fearless skeptic, who said that the story was of Danish origin, was condemned by the Canton of Uri to be burnt alive, and in the well-timed absence of the offender, his book was ordered to be burnt by the common hangman. But the truth is great, and prevails. G. von Wyss, the Swiss historian, has pointed out that the name of Wilhelm Tell does not occur even once in the history of the three cantons, neither is there any trace that a "Vogt" named Gessler ever served the house of Hapsburg there. Moreover, the legend does not correspond to any fact of a period of oppression of the Swiss at the hands of their Austrian rulers.

"There exist in contemporary records no instances of wanton outrage and insolence on the Hapsburg side. It was the object of that power to obtain political ascendency, not to indulge its representatives in lust or wanton insult," and, where records of disputes between particular persons occur, "the symptoms of violence, as is natural enough, appear rather on the side of the Swiss than on that of the aggrandizing imperial house." *

Candor, however, requires that the evidence in support of the legend should be stated. There is the fountain on the supposed site of the lime-tree in the market-place at Altdorf by which young Tell stood, as well as the colossal plaster statue of the hero himself which confronts us as we enter the quaint village. But more than this, the veritable cross-bow itself is preserved in the arsenal at Zurich!

However, although the little Tell's chapel, as restored, "was opened with a national *fête* in the presence of two members of the Federal Council, in June last," * the Swiss now admit in their school-teaching that the story of the *Apfelschusz* is legendary.

Freudenberger, who earned his death-sentence for affirming that the story came from Denmark, was on the right track, for the following variant of it is given by Saxo Grammaticus, a Danish writer of the twelfth century, who puts it as happening in the year 950:—

"Nor ought what follows to be enveloped in silence. Palnatoki, for some time in the body-guard of King Harold (Harold Gormson, or Bluetooth), had made his bravery odious to many of his fellow-soldiers by the zeal with which he surpassed them. One day, when he had drunk too much, he boasted that he was so skilled a bowman that he could hit the smallest apple, set on the top of a stick some way off, at the first shot, which boast reached the ears of the king. This monarch's wickedness soon turned the confidence of the father to the peril of the son, for he commanded that this dearest pledge of his life should stand in place of the stick, adding a threat that if Palnatoki did not at his first shot strike off the apple, he should with his head pay the penalty of making an empty boast. This command forced him to attempt more than he had promised, and what he *had* said, reported by slanderous tongues, bound him to accomplish what he had *not* said. Yet did not his sterling courage, though caught in the snare of slander, suffer him to lay aside his firmness of heart. As soon as the boy was led forth, Palnatoki warned him to await the speeding of the arrow with calm ears and unbent head, lest by any slight movement of the body he should frustrate the archer's well-tried skill. He then made him stand with his back toward him, lest he should be scared at the sight of the arrow. Then he drew three arrows from his quiver, and with the first that he fitted to the string he struck the apple. When the king asked him why he had taken more than one arrow from his quiver, when he

* *Edinburgh Review*, January, 1860, p. 134. Article on Rilliet's "Origines de la Confédération Suisse: Histoire et Légende."

* London *Times's* telegram from Geneva, June 25, 1883.

was to be allowed to make but one trial with his bow, he made answer, "That I might avenge on thee the swerving of the first by the points of the others, lest perchance my innocence might have been punished, while your violence escaped scot-free.'"*

Going further northward we find tales corresponding in their main features to the above, in the Icelandic Saga, the Vilkina; in the Norse Saga of Saint Olaf or Thidrik; and in the story of Harold, son of Sigurd. In the Olaf Saga it is said that the saint or king, desiring the conversion of a brave heathen, named Eindridi, competed with him in various athletic sports, swam with him, wrestled with him, and then shot with him. Olaf then dared Eindridi to strike a writing-tablet from off his son's head with an arrow, and bade two men bind the eyes of the child and hold the napkin so that the boy might not move when he heard the whizz of the arrow. Olaf aimed first, and the arrow grazed the lad's head. Eindridi then prepared to shoot, but the mother of the boy interfered and persuaded the king to abandon this dangerous test of skill. The story adds that had the boy been injured, Eindridi would have revenged himself on the king.†

Somewhat like this, as from the locality might be expected, is the Faroe Isles variant. King Harold challenges Geyti, son of Aslak, and, vexed at being beaten in a swimming match, bids Geyti shoot a hazel-nut from off his brother's head. He consents, and the king witnesses the feat, when Geyti

> "Shot the little nut away,
> Nor hurt the lad a hair."

Next day Harold sends for the archer, and says:—

> "List thee, Geyti, Aslak's' son,
> And truly tell to me,
> Wherefore hadst thou arrows twain
> In the wood yestreen with thee?"

To which Geyti answers:—

> "Therefore had I arrows twain
> Yestreen in the wood with me,
> Had I but hurt my brother dear
> The other had pierced thee."

With ourselves it is the burden of the ballad of William of Cloudeslee, where the brave archer says:—

> "I have a sonne seven years old;
> Hee is to me full deere;
> I will tye him to a stake—
> All shall see him that bee here—
> And lay an apple upon his head,
> And goe six paces him froe;
> And I myself with a broad arroe
> Shall cleave the apple in towe."

In the *Malleus Maleficarum*, Puncher, a magician on the Upper Rhine, is required to shoot a coin from off a lad's head; while traveling eastward, as far as Persia, we find the Tell myth as an incident in the poem "Mantic Ultraïr," a work of the twelfth century.

Thus far I have spoken of the variants of the legend found among Aryan peoples, and it is tempting to base upon this diffusion of a common incident a theory of its origin among the Central Asian ancestors of the Swiss and the Norseman, the Persian and the Icelander. But it is found among non-Aryans also. The ethnologist, Castren, whose researches in Finland have secured a valuable mass of fast-perishing materials, obtained this tale in the village Ultuwa. "A fight took place between some freebooters and the inhabitants of the village of Alajärai. The robbers plundered every house, and carried off among their captives an old man. As they proceeded with their spoils along the strand of the lake, a lad of twelve years old appeared from among the reeds on the opposite bank, armed with a bow and amply provided with arrows; he threatened to shoot down the captors unless the old man, his father, was restored to him. The robbers mockingly replied that the aged man would be given to him if he could shoot an apple off his head. The boy accepted the challenge, pierced the apple, and freed his father." Among a people in close contact with an Aryan race as the Finns are in contact with both Swedes and Russians, the main incident of the Tell story may easily have been woven into their native tales. But in reference to other non-Aryan races Sir George Dasent, who has treated of the diffusion of the Tell story very fully in the Introduction to his "Popular Tales from the Norse" (a reprint of which would be a boon to students of folk-lore), says that it is common to the Turks and Mongolians, and a legend of the wild Samoyedes, who never heard of Tell or saw a book in their lives, relates it, chapter and verse, of one of their marksmen. What shall we say, then, but that "the story of this bold master-shot was prominent among many

* Bk. x., p. 166. Cf. Baring Gould's "Curious Myths," p. 117; and Fiske's "Myths and Mythmakers," p. 4.

† Baring Gould, p. 119.

tribes and races, and that it only crystallized itself round the great name of Tell by that process of attraction which invariably leads a grateful people to throw such mythic wreaths, such garlands of bold deeds of precious memory, around the brow of its darling champion." * Of course the solar mythologists see in Tell the sun or cloud deity; in his bow the storm-cloud or the iris; and in his arrows the sun-rays or lightning darts.

This is a question which we might leave to the champions concerned to settle. Apart from the evidence of the survival of legend in history, and the lesson of caution in accepting any ancient record as gospel which we should learn therefrom, it is the human element in the venerable tale which interests us most.

Remote in time, far away in place, as its origin it moves us yet. The ennobling qualities incarnated in some hero (whether he be real or ideal matters not) meet with admiring response in the primitive listeners to the story, else it would have been speedily forgotten. Thus does it retain for us witness to the underlying oneness of the human heart beneath all surface differences.

XVIII.

MYTHS OF KING ARTHUR AND LLEWELLYN.

WIDESPREAD as a myth may be, it takes depth of root according to the more or less congenial soil where it is dropped. That about Tell found favorable home in the uplands and the free air of Switzerland, with us, S. George, falling on times of chivalry, had abiding place, as also, less rugged of type than the Swiss marksman, had Arthur, the "Blameless King," who, if he ever existed, is smothered in overgrowth of legends both native and imported.

For such cycle of tales as gathered round the name of Arthur, and on which our youthhood was nourished, is as mythical as the wolf that suckled Romulus and Remus. Modern criticism and research have thoroughly sifted the legendary from the true, and if the past remains vague and shadowy, we at least know how far the horizon of certainty extends. The criticism has made short work of the romancing chronicles which so long did duty for sober history, and has shown that no accurate knowledge of the sequence of events is obtainable until late in the period of the English invasions. Save in scattered hints here and there, we are quite in the dark as to the condition of this island during the Roman occupation, while for anything that is known of times prior to this, called for convenience "pre-historic," we are dependent upon unwritten records preserved in tombs and mounds. The information gathered from these has given us some clue to what manner of men they were who confronted the first Aryan immigrants, and, enriched by researches of the ethnologist and philologist, enabled us to trace the movements of races westward, until we find old and new commingled as one English-speaking folk.

All or any of which could not be known to the earlier chronicles. When Geoffry of Monmouth set forth the glory and renown of Arthur and his court, he recorded and embellished traditions six hundred years old, without thought of weighing the evidence or questioning the credibility of the transmitters. Whether there was a king of that name who ruled over the Silures, and around whom the remnant of brave Kelts rallied in their final struggle against the invading hordes, and who, wounded in battle, died at Glastonbury, and was buried, or rather sleeps, as the legend has it, in the Vale of Avilion, "hath been," as Milton says, "doubted heretofore, and may again, with good reason, for the Monk of Malmesbury and others, whose credit hath swayed most with the learned sort, we may well perceive to have known no more of this Arthur nor of his doings than we now living."

The comparative mythologists say that he is a myth pure and simple; a variant of Sigurd and Perseus; the winning of his famous sword but a repetition of the story of the Teutonic and Greek heroes; the gift of Guinevere as fatal to him as Helen to Menelaus; his knights but reproductions of the Achaian hosts. Much of which is doubtless true. But the romance corresponded to some probable event; it fitted in with the national traditions. There were struggles between the Kelts and subsequent invaders—Romans, Angles, Saxons, Jutes. There were brave chieftains who led forlorn hopes or fought to the death in their fastnesses. There were, in the numerous tribal divisions petty kings and queens ruling over mini-

* Introd. xxxv.

courts, with retinues of knights bent on chivalrous, unselfish service. These were the nuclei of stories which were the early annals of the tribe, the glad theme of bards and minstrels, and from which a long line of poets, to the latest singer of the "Idylls of the King," have drawn the materials of their epics. The fascination which such a cycle of tales had for the people, especially in days when the ballad was history and poetry and all literature rolled into one, was so strong, that the Church wisely imported an element which gave loftier meaning to the knightly life, and infused religious ardor into the camp and court. To the stories of Tristram and Gawayne already woven into the old romance, she added the half-Christian, half-pagan, legend of the knights who left the feast at the Round Table to travel across land and sea that they might free the enslaved, remove the spell from the enchanted, and deliver fair women from the monsters of tyranny and lust, set forth on what in her eyes was a nobler quest—to seek and look upon the San Graal, or Holy Vessel used by Jesus at the Last Supper, and into which Joseph of Arimathea collected the blood and water that streamed from the side of the crucified Jesus. This mystic cup, in which we have probably a sacrificial relic of the old British religion imported into the Christian incident with which it blended so well, floated, according to Arthurian legend, suddenly into the presence of the King and his Round Table knights at Camelot as they sat at supper, and was as suddenly borne away, to be henceforth the coveted object of knightly endeavor. Only the baptized could hope to behold it; to the unchaste it was veiled; hence only they among the knights who were pure in heart and life vowed to go in quest of the San Graal, and return not until they had seen it. So to Sir Galahad, the "just and faithful," Tennyson sings how the sacred cup appeared,

> "Sometimes on lonely mountain meres
> I find a magic bark;
> I leap on board: no helmsman steers:
> I float till all is dark.
> A gentle sound, an awful light!
> Three angels bear the holy Grail:
> With folded feet, in stoles of white,
> On sleeping wings they sail.
> Ah, blessed vision! blood of God!
> My spirit beats her mortal bars,
> As down dark tides the glory slides,
> And, star-like, mingles with the stars."

While in such legends as the Arthurian group the grain of truth, if it exists, is so imbedded as to be out of reach, there are others concerning actual personages, notably Cyrus and Charlemagne, not to quote other names from both "profane" and sacred history, in which the fable can be separated from the fact without difficulty. Enough is known of the life and times of such men to detach the certain from the doubtful, as, *e.g.*, when Charlemagne is spoken of as a Frenchman and as a Crusader before there was a French nation, or the idea of Crusades had entered the heads of Most Christian Kings; and as in the legends of the infancy of Cyrus, which are of a type related to like legends of the wonderful round the early years of the famous.

This, however, by the way, since, leaving illustration of the fabulous in heroic story, it will be interesting to trace it through such a tale of pathos and domestic life as the well-known one of Llewellyn and his faithful hound, Gellert.

Whose emotions have not been stirred by the story of Llewellyn the Great going out hunting, and missing his favorite dog; of his return, to be greeted by the creature with more than usual pleasure in his eye, but with jaws besmeared with blood; of the anxiety with which Llewellyn rushed into the house, to find the cradle where had lain his beautiful boy upset, and the ground around it soaked with blood; of his thereupon killing the dog, and then seeing the child lying unharmed beneath the cradle, and sleeping by the side of a dead wolf, from whose ravenous maw the faithful Gellert had delivered it? Most of us, in our visits to North Wales, have stood by Gellert's grave at Beddgelert, little suspecting that the affecting story occurs in the folk-lore of nearly every Aryan people, and of several non-Aryan races, as the Egyptians and Chinese.

Probably it comes to us as many other tales have come, through collections like the well-known "Gesta Romanorum," compiled by mediæval monks for popular entertainment. In the version given in that book, the knight who corresponds to Llewellyn, after slaying his dog, discovers that it had saved his child from a serpent, and thereupon breaks his sword and departs on a pilgrimage to the Holy Land. But the monks were no inventors of such tales; they recorded those that came to them through the pilgrims, students, traders, and warriors who traveled from West to East and from East to West in the Middle Ages, and it is in the native

home of fable and imagery, the storied Orient, that we must seek for the earliest forms of the Gellert legend. In the Panchatantra, the oldest and most celebrated Sanskrit fable book, the story takes this form :—An infirm child is left by its mother while she goes to fetch water, and she charges the father, who is a Brahman, to watch over it. But he leaves the house to collect alms, and soon after this a snake crawls toward the child. In the house was an ichneumon, a creature often cherished as a house pet, who sprang at the snake and throttled it. When the mother came back, the ichneumon went gladly to meet her, his jaws and face smeared with the snake's blood. The horrified mother, thinking it had killed her child, threw her water-jar at it, and killed it; then seeing the child safe beside the mangled body of the snake, she beat her breast and face with grief, and scolded her husband for leaving the house.

We find the same story, with the slight difference that the animal is an otter, in a later Sanskrit collection, the Hitopadesa, but we can track it to that fertile source of classic and mediæval fable, the Buddhist Jatakas, or Birth Stories, a very ancient collection of fables, which, professing to have been told by Buddha, narrates his exploits in the 550 births through which he passed before attaining Buddhahood. In the Vinaya Pitaka of the Chinese Buddhist collection, which, according to Mr. Beal, dates from the fifth century A.D., and is translated from original scriptures supposed to have existed near the time of Asoka's council in the third century B.C., we have the earliest extant form of the tale. That in the Panchatantra is obviously borrowed from it, the differences being in unimportant detail, as, for example, the nakula, or mongoose, is killed by the Brahman on his return home, the wife having neglected to take the child with her as bidden by him. He is filled with sorrow, and then a Deva continues the strain :—

Let there be due thought and consideration,
Give not way to hasty impulse,
By forgetting the claims of true friendship
You may heedlessly injure a kind heart (person)
As the Brahman killed the nakula.

The several versions of the story which could be cited from German, Russian, Persian, and other Aryan folk-lore, would merely present certain variations due to local coloring and to the inventiveness of the narrators or transcribers; and, omitting these at the demand of space, it will suffice to give the Egyptian variant or corresponding form, in which the tragical has given place to the amusing, save, perhaps, in the opinion of the Wali. This luckless person "once smashed a pot full of herbs which a cook had prepared. The exasperated cook thrashed the well-intentioned but unfortunate Wali within an inch of his life, and when he returned, exhausted with his efforts at belaboring the man, he discovered among the herbs a poisonous snake."

In pointing to the venerable Buddhist Birth Stories as the earliest extant source of Aryan fables, it should be added that these were with Buddha and his disciples the favorite vehicle of carrying to the hearts of men those lessons of gentleness and tenderness toward all living things which are a distinctive feature of that non-persecuting religion, and thus of diffusing a spirit which would have us.

Never to blend our pleasure or our pride
With sorrow of the meanest thing that lives.

XIX.

SEMITIC MYTHS AND LEGENDS.

WITH the important exception of reference to the change effected in the Jewish doctrines of spirits, and its resulting influence on Christian theology, by the transformation of the mythical Ahriman of the old Persian religion into the archfiend Satan, but slight allusion has been made in these pages to the myths and legends of the Semitic race. Under this term, borrowed from the current belief in their descent from Shem, are included extant and extinct people, the Assyrians, Chaldeans or Babylonians, Phœnicians, Arabs, Syrians, Jews and Ethiopians.

The mythology of the Aryan nations has had the advantage of the most scholarly criticism, and the light which this has thrown upon the racial connection of peoples between whom all superficial likeness had long disappeared, as well as upon the early condition of their common ancestors, is of the greatest value as aid to our knowledge of the mode of man's intellectual and spiritual growth. And the comparisons made between the older and cruder forms underlying the elaborated myth and the myths of semi-barbarous races have supported conclusions concerning man's primitive state identical with those de-

duced from the material relics of the Ancient and Newer Stone Ages, namely, that the savage races of to-day represent not a degradation to which man has sunk, but a condition out of which all races above the savage have, through much tribulation, emerged. An important exception to this has, however, been claimed on behalf of at least one branch of the Semitic race—namely, the Hebrews or Jews. This claim has rested on their assumed selection by the Deity for a definite purpose in the ordering and directing of human affairs; a theory of the divine government which this journal is concerned neither to defend nor deny. No assumption of supernatural origin can screen documents of disputed authorship and uncertain meaning from the investigation applied to all ancient records; nor can the materials elude dissection because hitherto regarded as organic parts of revelation. The real difficulties are in the structure of the language and in the scantiness of the material as contrasted with the flexile and copious mythology of the Aryan race. And the investigation has been in some degree checked by the mistaken dicta of authorities such as M. Renan and the late Baron Bunsen; the former contending that "the Semites never had a mythology," and the latter (although any statement of his carries far less weight) that "it is the grand, momentous, and fortunate self-denial of Judaism to possess none."

But, independently of the refusal of the student of history to admit that exceptional place has been of direct Divine purpose accorded to any particular race, the discoveries of literatures much older than the Hebrew, and in which legends akin to those in the earlier books of the Old Testament are found, together with the proofs of historical connection between the peoples having these common legends, have given the refutation to the distinctive character of the Semitic race claimed by M. Renan. That a people dwelling for centuries, as the Hebrews did, in a land which was the common highway between the great nations of antiquity; a people subject to vicissitudes bringing them, as the pipkin between iron pots, into collision and subject relations to Egyptians, Persians, and other powerful folk, should remain uninfluenced in their intellectual speculations and religious beliefs, would indeed be a greater miracle than that which makes their literature inspired in every word and vowel-point. The remarkable collection of cuneiform inscriptions (so called from their wedge-like shape: Lat. *cuneus*, a wedge) on the baked clay cylinders and tablets of the vast libraries of Babylon and Nineveh, has brought out one striking fact, namely, that the Semitic civilization, venerable as that is, was the product of, or at least greatly influenced by, the culture of a non-Semitic people called the Akkadians, from a word meaning "highlanders." These more ancient dwellers in the Euphrates valley and uplands were not only non-Semitic, but non-Aryan, and probably racionally connected with the complex group of peoples embracing the Tartar-Mongolians, the distinguishing features of whose religion are Shamanistic, with belief in magic in its manifold forms. "In Babylonia, under the non-Semitic Akkadian rule, the dominant creed was the fetish worship, with all its ritual of magic and witchcraft; and when the Semites conquered the country, the old learning of the land became the property of the priests and astrologers, and the Akkadian language the Latin of the Empire."*

It was during the memorable period of the Exile that the historical records of the Jews underwent revision, and from that time dates the incorporation into them of legends and traditions which, invested with a purity and majesty distinctively Hebrew, were borrowed from the Babylonians, although primarily Akkadian. They are here, as elsewhere, the product of the childhood of the race, when it speculates and invents, framing its theory of the beginnings, their when and how; when it prattles of the Golden Age, which seems to lie behind, in the fond and not extinct delusion that "the old is better;" when it frames its fairy tales, weird or winsome, in explanation of the uncommon, the unknown, and the bewildering.

The Babylonian origin of the early biblical stories is now generally admitted, although the dogmas based upon certain of them still retard the acceptance of this result of modern inquiry in some quarters. That reluctance is suggestively illustrated in Dr. Wm. Smith's "Dictionary of the Bible," where, turning to the heading "Deluge," the reader is referred to "Flood" and hence to "Noah!"

So much for the legendary; but the analysis, of the more strictly mythical, the names of culture-ancestors and heroes, sons of Anak and of God, scattered over the Pentateuch, is not so easy a matter. The most important work in this direction has been attempted by Dr. Gold-

* *Academy*, Nov. 17, 1877, p. 472.

ziher,* but even his scholarship has failed to convince sympathetic readers that Abraham and Isaac are sun-myths, and that the twelve sons of Jacob are the zodiacal signs! Under the Professor's etymological solvent the personality of the patriarchs disappears, and the charming idylls and pastorals of old Eastern life become but phases of the sun and the weather. The Hebrew, like the Aryan myth-maker, speaks of the relations of day and night, of gray morning and sunrise, of red sunset and the darkness of night, as of love and union, or strife and pursuit, or gloomy desire and coy evasion. Abh-râm is the High or Heaven-Father (from *râm*, "to be high") with his numberless host of descendants. Yis-châk, commonly called Isaac, denotes "he who laughs," and so the Laughing one, whom the High Father intends to slay, is the smiling day or the smiling sunset, which gets the worst of the contest with the night sky and disappears. Sarah signifies princess, or the moon, the queen who rules over the great army glittering amid the darkness. The expulsion of Hagar (derived from a root *hajara*, meaning "to fly," and yielding the word hijrâ or "flight," whence the Mohammedan Hegira) is the Semitic variant of the inexhaustible theme of all mythology, the battle of Day and Night; Hagar flying before the inconstant sun and the jealous moon. And so on through the whole range of leading characters in Hebrew history; Cain and Abel, in which the critic overlooks the more likely explanation of the story as a quarrel between nomads and tillers of the soil; Jephthah, in which the sun-god kills at mid-day the dawn, his own offspring; Samson, or more correctly Shimshôn, from the Hebrew word for sun, the incidents of whose life, as expounded by Professor Steinthal,† are more clearly typical of the labors of the sun; Jonah and the fish, a story long ago connected with the myth of Herakles and Hêsionê; "as on occasion of the storm the dragon or serpent swallows the sun, so when he sets he is swallowed by a mighty fish, waiting for him at the bottom of the sea. Then when he appears again on the horizon, he is spat out on the shore by the sea-monster." ‡

These bare references must suffice to show that there is in Hebrew literature a large body of material which must undergo the sifting and the criticism which has been applied with success to Indo-European and non-Aryan myth. This done, the Semitic race will contribute its share of evidence in support of those conditions under which it has been the main purpose of these papers to show that myth has its birth and growth.

* "Mythology among the Hebrews, and its Historical Development." London: Longmans. 1877.

† "Goldziher," pp. 392, ff.

‡ Ibid. p. 103.

XX.

CONCLUSION.

THE serial form of publication* has its advantages in these run-and-read days in compelling the writer to pack his thoughts closely together, but it has its disadvantages in breaking their sequence, and compelling the reader to turn to back numbers for the missing links.

The multitude of subjects traversed in these chapters compelled presentment in so concise a form that any attempt to gather into a few sentences the sum of things said would be as a digest of a digest, and it is, therefore, better to briefly emphasize the conclusions to which the gathered evidence points. It was remarked at the outset, when laying stress on the serious meaning which lies at the heart of myths, that they have their origin in the endeavor of barbaric man to explain his surroundings. The mass of fact brought together illustrates and confirms this view, and has thereby tended to raise what was once looked upon as fantastic, curious, and lawless, to the level of a subject demanding sober treatment and examination on strictly scientific methods.

Archbishop Trench, in his "Study of Words," quotes Emerson's happy characterization of language as fossil poetry and fossil history: "Just as in some fossil, curious and beautiful shapes of vegetable or animal life, the graceful fern, or the finely-vertebrated lizard, such as have been extinct for thousands of years, are permanently bound up with the stone, so in words are beautiful thoughts and images, the imagination and the feeling of past ages of men long since in their graves, of men whose very names have perished, preserved and made safe forever."† In like manner, we may speak of myths as

* These papers were originally published in Mr. R. A. Proctor's weekly scientific magazine, *Knowledge*.

† "Study of Words," HUMBOLDT LIBRARY, No. 30, p. 2.

fossil ethics and fossil theology, but, with more appositeness, as embryonic ethics and theology, since they contain potentially all the philosophies and theologies "that man did ever find."

And to the student of the history of humanity who rejoices in the sure foundation on which, tested in manifold ways, the convictions of the highest and noblest of the race rest, the value of myth is increased in its being a natural outgrowth of the mind when, having advanced to the point at which curiosity concerning the causes of surrounding things arises, it frames its crude explanations. For not that which man claims to have received as a message from the gods, as a revelation from heaven, but that which he has learned by experience often painful and bitter, and which succeeding generations have either verified or improved upon, or disproved altogether, is, in the long run, of any worth. Through it alone, as we follow the changes wrought in the process from guess to certainty, can we determine what was the intellectual stage of man in his mental infancy, and how far it finds correspondences in the intellectual stage of existing barbaric races.

Thus, the study of myth is nothing less than the study of the mental and spiritual history of mankind. It is a branch of that larger, vaster science of evolution which so occupies our thoughts to-day and with which the philosopher and the theologian must reckon. The evidence which it brings from the living and dead mythologies of every race is in accord with that furnished by their more tangible relics, that the history of mankind is a history of slow but sure advance from a lower to a higher; of ascent, although with backslidings oft. It confirms a momentous canon of modern science, that the laws of evolution in the spiritual world are as determinable as they are in the physical. To this we, for the enrichment of our life and helpful service of our kind, do well to give heed. Wherever we now turn eye or ear the unity of things is manifest, and their unbroken harmony heard. With the theory of evolution in our hands as the master-key, the immense array of facts that seemed to lie unrelated and discrete, are seen to be interrelated and in necessary dependence—"a mighty sum of things forever speaking." That undisturbed relation of cause and effect which science has revealed and confirmed, extends backward as well as reaches forward; its continuity involves the inclusion of man as a part of nature, and the study of his development as one in which both the biologist and the mythologist engage toward a common end.

APPENDIX.

AN AMERICAN INDIAN MYTH.

[This interesting mythic tale is taken from J. W. Powell's "Mythology of the North American Indians" (First Annual Report of the Bureau of Ethnology). It is entitled "Ta-vwots' has a fight with the Sun."]

Ta-vwots', the little rabbit, was wont to lie with his back to the sun when he slept. One day he thus slept in camp while his children played around him. After a time they saw that his back was smoking, and they cried out, "What is the matter with your back, father?" Startled from his sleep, he demanded to know the cause of the uproar. "Your back is covered with sores, and full of holes," they replied. Then *Ta-vwots'* was very angry, for he knew that *Ta'-vi*, the sun, had burned him, and he sat down by the fire for a long time in solemn mood, pondering on the injury and insult he had received. At last, rising to his feet, he said, "My children, I must go and make war upon *Ta'-vi*." And straightway he departed.

Now his camp was in the valley of the Mo-a-pa [a stream in South-eastern Nevada]. On his journey he came to a hill, and standing on its summit he saw in a valley to the east a beautiful stretch of verdure, and he greatly marveled at the sight, and desired to know what it was. On going down to the valley he found a cornfield, something he had never before seen, and the ears were ready for roasting. When he examined them, he saw that they were covered with beautiful hair, and he was much astonished. Then he opened the husk, and found within soft white grains of corn, which he tasted. Then he knew that it was corn, and good to eat. Plucking his arms full he carried them away, roasted them on a fire, and ate until he was filled.

Now when he had done all this, he reflected that he had been stealing, and he was afraid; so he dug a hole in which to hide himself.

Cin-au'-äv was the owner of this field, and when he walked through and saw that his corn had been stolen he was ex-

ceedingly wroth, and said, "I will slay this thief *Ta-vwots'*; I will kill him, I will kill him." And straightway he called his warriors to him and made search for the thief, but could not find him, for he was hid in the ground. After a long time they discovered the hole, and tried to shoot *Ta-vwots'* as he was standing in the entrance, but he blew their arrows back. This made *Cinau'-äv's* people very angry, and they shot many arrows, but *Ta-vwots's* breath was as a warder against them all. Then with one accord they ran to snatch him up with their hands, but, all in confusion, they only caught each other's fists, for with agile steps *Ta-vwots* dodged into his retreat. Then they began to dig, and said they would drag him out. And they labored with great energy, all the time taunting him with shouts and jeers. But *Ta-vwots'* had a secret passage from the main chamber of his retreat, which opened by a hole above the rock overhanging the entrance where they were at work.

When they had proceeded with this digging until they were quite under ground, *Ta-vwots'*, standing on the rock above, hurled the magical ball which he was accustomed to carry with him, and striking the ground above the diggers, it caved the earth in, and they were all buried. "Aha," said he, "why do you wish to hinder me on my way to kill the Sun? *A'-nicr ti-tik-a-nûmp kwaik-ai'-gar* (fighting is my eating tool, I say; that's so)," and he proceeded on his way musing, "I have started out to kill; vengeance is my work; every one I meet will be an enemy. It is well; no one shall escape my wrath."

The next day he saw two men making arrow-heads of hot rocks, and drawing near he observed their work for a time from a position where he could not be seen. Then stepping forth he said, "Let me help you," and when the rocks were on the fire again and were hot to redness he said, "Hot rocks will not burn me." And they laughed at him. "May be you would have us believe that you are a ghost?" "I am not a ghost," said he, "but I am a better man than you are. Hold me on these hot rocks, and if I do not burn you must let me do the same to you." To this they readily agreed, and when they had tried to burn him on the rocks, with his magic breath he kept them away at a distance so slight they could not see but that the rocks did really touch him. When they perceived that he was not burned they were greatly amazed, and trembled with fear. But having made the promise that he should treat them in like manner, they submitted themselves to the torture, and the hot rocks burned them until, with great cries, they struggled to get free, but unrelenting *Ta-vwots'* held them until the rocks had burned through their flesh into their entrails, and so they died. "Aha," said *Ta-vwots'*, "lie there until you can get up again. I am on my way to kill the Sun. *A'-nier ti-tik-a-nûmp kwaik-ai'-gar.*" And sounding the war-whoop he proceeded on his way.

The next day he came to where two women were gathering berries in baskets, and when he sat down they brought him some of the fruit and placed it before him. He saw there were many leaves and thorns among the berries, and he said, "Blow these leaves and thorns into my eyes," and they did so, hoping to blind him; but with his magic breath he kept them away, so that they did not hurt him.

Then the women averred that he was a ghost. "I am no ghost," said he, "but a common person. Do you not know that leaves and thorns cannot hurt the eye? Let me show you;" and they consented, and were made blind. Then *Ta-vwots'* slew them with his *pa-rûm'-o-kwi*. "Aha," said he, "you are caught with your own chaff. I am on my way to kill the Sun. This is good practice—I must learn how. *A'-nier ti-tik'-a-nûmp kwaik-ai'-gar.*" And sounding the war-whoop he proceeded on his way.

The next day he saw some women standing on the Hurricane Cliff, and as he approached he heard them say to each other that they would roll rocks down upon his head and kill him as he passed; and drawing near, he pretended to be eating something and enjoying it with great gusto; so they asked him what it was, and he said it was something very sweet, and they begged that they might be allowed to taste of it also. "I will throw it up to you," said he; "come to the brink and catch it." When they had done so, he threw it up so that they could not quite reach it, and he threw it in this way many times, until, in their eagerness to secure it, they all crowded too near the brink, fell, and were killed. "Aha," said he, "you were killed by your own eagerness. I am on my way to kill the Sun, *A'-nier ti-tik'-a-nûmp kwaik-ai'-gar.*" And sounding the war-whoop he passed on.

The following day he saw two women fashioning water-jugs, which are made of

willow-ware, like baskets, and afterward lined with pitch. When afar off he could hear them converse, for he had a wonderful ear. "Here comes that bad *Ta-vwots'*," said they; "how shall we destroy him?" When he came near, he said, "What was that you were saying when I came up?" "Oh, we were only saying, 'Here comes our grandson,'"* said they. "Is that all?" replied *Ta-vwots'*, and looking around he said, "Let me go into your water-jug;" and they allowed him to do so. "Now braid the neck." This they did, making the neck very small; then they laughed with great glee, for they supposed he was entrapped. But with his magic breath he burst the jug and stood up before them; and they exclaimed, "You must be a ghost!" but he answered, "I am no ghost. Do you not know that jugs were made to hold water, but cannot hold men and women?" At this they wondered greatly, and said he was wise. Then he proposed to put them in jugs in the same manner, in order to demonstrate to them the truth of what he had said; and they consented. When he had made the necks of the jugs and filled them with pitch he said, "Now jump out;" but they could not. It was now his turn to deride; so he rolled them about and laughed greatly, while their half-stifled screams filled the air. When he had sported with them in this way until he was tired he killed them with his magical ball. "Aha," said he, "you are bottled in your own jugs. I am on my way to kill the Sun; in good time I shall learn how. *A'-nier ti-tik'-a-nûmp kwaik-ai'-gar.*" And sounding the war-whoop he passed on.

The next day he came upon *Kwi'-ats*, the bear, who was digging a hole in which to hide, for he had heard of the fame of *Ta-vwots'* and was afraid. When the great slayer came to *Kwi'-ats* he said, "Don't fear, my great friend, I am not the man from whom to hide. Could a little fellow like me kill so many people?" And the bear was assured. "Let me help you dig," said *Ta-vwots'*, "that we may hide together, for I also am fleeing from the great destroyer. So they made a den deep in the ground, with its entrance concealed by a great rock. Now *Ta-vwots'* secretly made a private passage from the den out to the side of the mountain, and when the work was completed the two went out together to the hill-top to watch for the coming of the enemy. Soon *Ta-vwots'* pretended that he saw him coming, and they ran in great haste to the den. The little one outran the greater, and going into the den hastened out again through his secret passage.

When *Kwi'-ats* entered he looked about, and not seeing his little friend he searched for him for some time, and still not finding him, he supposed that he must have passed him on the way, and went out again to see if he had stopped or been killed. By this time *Ta-vwots'* had perched himself on the rock at the entrance of the den, and when the head of the bear protruded through the hole below he hurled his *pa-rûm'-o-kwi* and killed him. "Aha," said *Ta-vwots'*, "I greatly feared this renowned warrior, but now he is dead in his own den. I am going to kill the Sun. *A'-nier ti-tik'-a-nûmp kwaik-ai'-gar.*" And sounding the war-whoop he went on his way.

The next day he met *Ku-mi'-a-pöts*, the tarantula. Now this knowing personage had heard of the fame of *Ta-vwots'* and determined to outwit him. He was possessed of a club with such properties that, although it was a deadly weapon when used against others, it could not be made to hurt himself, though wielded by a powerful arm.

As *Ta-vwots'* came near, *Ku-mi'-a-pöts* complained of having a headache; moaning and groaning, he said there was an *u-nu'-pits*, or little evil spirit, in his head, and he asked *Ta-vwots'* to take the club and beat it out. *Ta-vwots'* obeyed, and struck with all his power, and wondered that *Ku-mi'-a-pöts* was not killed; but he urged *Ta-vwots'* to strike harder. At last *Ta-vwots'* understood the nature of the club and guessed the wiles of *Ku-mi'-a-pöts*, and raising the weapon as if to strike again, he dexterously substituted his magic ball and slew him. "Aha," said he, "that is a blow of your own seeking, *Ku-mi'-a-pöts*. I am on my way to kill the Sun; now I know that I can do it. *A'-nier ti-tik'-a-nûmp kwaik-ai'-gar.*" And sounding his war-whoop he went on his way.

The next day he came to a cliff which is the edge or boundary of the world on the east, where careless persons have fallen into unknown depths below. Now to come to the summit of this cliff it is necessary to climb a mountain, and *Ta-vwots'* could see three gaps or notches in the mountain, and he went up into the one on the left; and he demanded to know

* This is a very common term of endearment used by elder to younger persons.

of all the trees which were standing by of what use they were. Each one in turn praised its own qualities, the chief of which in every case was its value as fuel. *Ta-vwots'* shook his head and went into the center gap, and had another conversation with the trees, receiving the same answer. Finally he went into the third gap—that on the right. After he had questioned all the trees and bushes, he came at last to a little one called *yu'-i-nump*, which modestly said it had no use, that it was not even fit for fuel. "Good," said *Ta-vwots'*, and under it he lay down to sleep.

When the dawn came into the sky *Ta-vwots'* arose and stood on the brink overhanging the abyss from which the Sun was about to rise. The instant it appeared he hurled his *pa-rûm-o-kwi*, and striking it full in the face shattered it into innumerable fragments, and these fragments were scattered over all the world and kindled a great conflagration. *Ta-vwots'* ran and crept under the *yu'-i-nump* to obtain protection. At last the fire waxed very hot over all the world, and soon *Ta-vwots'* began to suffer and tried to run away; but as he ran his toes were burned off, and then slowly, inch by inch, his legs, and then his body, so that he walked on his hands; and these were burned, and he walked on the stumps of his arms; and these were burned, until there was nothing left but his head. And now, having no other means of progression, his head rolled along the ground until his eyes, which were much swollen, burst by striking against a rock, and the tears gushed out in a great flood which spread out over all the land and extinguished the conflagration.

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FETICHISM:

A CONTRIBUTION TO ANTHROPOLOGY AND THE HISTORY OF RELIGION.

By FRITZ SCHULTZE, Dr. Phil.

TRANSLATED FROM THE GERMAN BY J. FITZGERALD, M.A.

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CHAPTER I.

INTRODUCTORY.

David Hume was the first in modern times to reject the transcendental theories of Religion and to seek an explanation for it in the empiric world of man, on psychological principles. "No passions," says he, "can be supposed to work upon such barbarians, but the ordinary affections of human life; the anxious concern for happiness, the dread of future misery, the terror of death, the thirst of revenge, the appetite for food and other necessaries. These are their only motives." *

To these motives of fear and hope Hume now adds, on the one hand, man's ignorance of Nature and of its phenomena; and on the other the faculty of imagination, as factors going to make up the notion of God. "We hang in perpetual suspense between life and death, health and sickness, plenty and want, which are distributed among the human species by secret and unknown causes, whose operation is oft unexpected and always unaccountable. These *unknown causes*, then, become the constant object of our hope and fear; and while the passions are kept in perpetual alarm by an anxious expectation of the events, the imagination is equally employed in forming ideas of those powers, on which we have so entire a dependence. Could men anatomize nature, according to the most probable, at least the most intelligible philosophy, they would find that these causes are nothing but the particular fabric and structure of the minute parts of their own bodies and of external objects; and that, by a regular and constant machinery, all the events are produced, about which they are so much concerned. But this philosophy exceeds the comprehension of the ignorant multitude, who can only conceive the *unknown causes*, in a general and confused manner; though their imagination, perpetually employed on the same subject, must labor to form some particular and distinct idea of them. The more they consider these causes themselves, and the uncertainty of

* David Hume, *Works*, Vol. IV.

their operation, the less satisfaction do they meet with in their researches; and, however unwilling, they must at last have abandoned so arduous an attempt, were it not for a propensity in human nature, which leads into a system that gives them satisfaction. There is a universal tendency among mankind to conceive all beings like themselves, and to transfer to every object those qualities with which they are familiarly acquainted, and of which they are intimately conscious. We find human faces in the moon, armies in the clouds, and by a natural propensity, if not corrected by experience and reflection, ascribe malice or good-will to everything that hurts or pleases us. Hence the frequency and beauty of the *prosopopœia* in poetry, where trees, mountains and streams are personified, and the inanimate parts of nature acquire sentiment and passion." "No wonder, then, that mankind, being placed in such an absolute ignorance of causes, and being at the same time so anxious concerning their future fortune, should immediately acknowledge a dependence on invisible powers, possessed of sentiment and intelligence." Such is the account which Hume gives of Polytheism. He does not, it is true, make an application of his theory to Fetichism directly, though much of what he says about the rise of Polytheism will serve equally well to account for fetichism.

Benjamin Constant, inasmuch as he looks for the origin of religion in man himself, agrees with Hume; but inasmuch as he postulates a special faculty, "the religious sentiment," which is not demonstrable, he again quits the empirical standpoint. Meiners, in his History of Religions, agrees fully with Hume, whose theory he states, and then makes this application of it to the subject of fetichism: "Fetichism," says he, "is not only the most ancient, but it is also the most universal form of religion. It furnishes incontrovertible proof that the lack of correct knowledge was the true and only cause of polytheism; and that for the uncultured savage everything is God, or may be God." * Kaiser, in his "Biblical Theology," places the origin of religion, not in this or that sentiment, but "subjectively in the entire character of man," and "objectively in Nature, to which man is related." † He holds that primitive man was without the impress of Spirit, that he was developed out of inferior organisms and that his first attempt at a religious belief took the form of fetichism. "The first, or the best piece of wood, or stone he meets,—some animal, some star will be esteemed a god." "While the intellectual faculties are still dormant, and in the absence of knowledge and experience, of invention and culture, whether mental or moral, we are not to be surprised if man regards proximate causes as ultimate, and pays worship to material objects, especially those which arrest his attention by their brightness, their velocity, their great size, etc." "The necessities of the case, and history itself prove that fetichism is the primitive religion of man. The base of human culture rests upon the earth, but its summit penetrates the invisible spaces of heaven, and reaches into infinity."

This theory of Kaiser's, in so far as it differs from Hume's and agrees with that of Meiners in asserting that fetichism is the primitive religion, is rejected by Theodor Waitz in his "Anthropology of Savage Tribes." He holds with Hume, that "a rude systemless Polytheism" was the primitive religion; and his arguments are identical with those of Hume as already set forth.‡ According to him,

* C. Meiners, Allg. Krit. Gesch. d. Religionen. Hannover, 1806, Vol. I. S. 143.

† Gottl. Phil. Christ. Kaiser, Die biblische Theologie oder Judaismus u. Christianismus nach der grammatisch-historischen Interpretationsmethode u. nach einer freimüthigen Stellung in die Kritisch-vergleichende Universalgeschichte der Religionen und in die universale Religion. Erlangen, 1813. Theil, I. S. 2.

‡ Th. Waitz, Anthropologie der Naturvölker.

fetichism springs from polytheism, and here he agrees with Pfleiderer. But whereas according to Pfleiderer external causes bring about its development, Waitz assigns for it causes purely internal and psychological. "The negro," says he, "carries the belief in an animated Nature to its uttermost limits; but as his mind is too rude to conceive of *one* universal animated nature, his imagination leads him to regard every trifling object around him as endowed with life. In every material thing he sees a spirit, often of great power, and quite disproportionate to the object itself." This object and this spirit make up a whole, the *fetich*. Waitz, however, does not explain to us the reason why the savage takes this view of material and inanimate things, and yet this is a question of high importance.

And precisely this point do I find treated with great clearness by Reinhard in his valuable "Historical Sketch of the Rise and Progress of Religious Ideas."* From the fact that religion is to be found among men, whatever their condition, he concludes that it must have its basis in the human mind itself, and he holds that if we would study the origin of religious ideas we must go back to the ages of barbarism, that is, to primitive times. That religion then was monotheistic cannot be shown: but on the other hand fetichism always characterizes the lowest stage of intellectual development. [The account given by Reinhard of the rise of fetichism, being substantially that which is set forth in the present work, need not be given here, as it will be found in full detail in the subsequent chapters; and as Feuerbach agrees in essentials with Reinhard it will be enough to make a general reference to his work upon this subject.†]

The true way of arriving at an understanding of fetichism is by observing savage life; and here, books of travel are of great importance. Among these there is none more instructive than A. Bastian's "Visit to San Salvador, Capital of the Kingdom of Congo: a Contribution to Mythology and Psychology."* As the author never transfers to the savage his own thoughts and motives, but views him as he is, from the psychological point of view, his work is properly called a contribution to psychology, and with equal justice a contribution to mythology, since fetichism is the first step in religion.

CHAPTER II.

THE MIND OF THE SAVAGE IN ITS INTELLECTUAL AND MORAL ASPECTS.

By fetichism we understand the religious veneration of material objects. If such objects are to be worshiped, they must first of all appear to be worthy of veneration, or, in other words, the worshiper must so consider them. The fetich, however, *e.g.* a piece of metal, still continues to be, in external form and in essential constitution, the self-same thing, whether observed by a European or by an African. Hence that which renders it a fetich is nothing intrinsic to the thing itself, but the view which the fetichist takes of it. If therefore we would understand fetichism in its true nature, we must investigate the savage's mode of apprehending objects, or in other words, we must study the intellectual status of the fetichist. Fetichism has an historical position in all nations which stand lowest in intellectual development, that is, among savages, so-called. Our first

* Phil. Christ. Reinhard, Abriss einer Geschichte der Entstehung der religiösen Ideen. Jena, 1794.

† Ludwig Feuerbach, Das Wesen der Religion. Vorlesungen über das Wesen der Religion. Nebst Zusätzen u. Aumerkungen. Leipzig, 1851.

* Afrikanische Reisen von Dr. A. Bastian. Ein Besuch in San Salvador, der Hauptstadt der Königreichs Congo. Bremen, 1859.

task, accordingly, will be to ascertain the savage's intellectual status. We propose therefore to sketch the savage mind first in its logical, and then in its ethical aspects.

1. *The Intellect of the Savage.*

The understanding has cognition only of those objects which are given to it in experience, and its range is consequently restricted by the limits of its experience. But what are the objects of experience? Those which are to be found in the man's *world:* and hence a man's cognitions can never go beyond *his world.* We say *his* world, meaning the universe, as far as he knows it. If therefore we would fix the intellectual status of any individual, we must first ascertain the number and the nature of his cognitions or objects.

As the understanding, then, has no cognitions save those which come to it out of its world, it follows that the number and the nature of one man's cognitions, or objects—in other words, the empiric contents of his mind—will differ from those of another, just as their respective *worlds* differ. Thus the sum-total of cognitions held by a mountaineer is different from that held by a seafaring man; and an Eskimo's cognitions are different from those of a Hindu, in proportion as their respective worlds differ; and they mutually resemble each other, in proportion as their worlds are alike. The *number* of objects (cognitions) differs in the same way. Thus the savage has but few, while the civilized European has many. From the paucity or the multiplicity of these flow consequences of the highest importance for a just estimate of the respective individuals. The greater the number of objects which a man has, the better equipped and the more cultivated will be his understanding, the more alert his thinking faculty, and the higher his development as a human being. On the other hand, the fewer his objects, the lower is his grade of development. It is universally true that man grows only as he apprehends objects.

The most fully developed intellect, therefore, is that which possesses the greatest number of objects. But if I would have many objects, I must discriminate and distinguish between them sharply; for unless they be thus defined, they tend to amalgamate, and so the number of objects would be diminished. Hence it is only in proportion as the understanding draws distinctions, that its objects are manifold and varied; and *vice versa*, it can make sharp distinctions only where its objects are varied. From this it follows that the faculty of accurate thinking or of sharply defining depends immediately and necessarily upon the number of the objects, so that, given the number of a man's objects, we might determine the strength or the feebleness of his thinking powers, or of his intellectual faculty. But since the objects are distinct only in so far as the understanding discriminates between them, the number of the objects must depend upon the sharpness with which these distinctions are drawn.

The status of a people as regards civilization might be determined by the greater or less accuracy with which they discriminate between objects; and the lowest grade of culture will accordingly be characterized by a lack of the power of discrimination. In the domain of *thought* that man only will attain eminence who can make distinctions where others do not. All erroneous and illogical thinking owes its rise to a weakness of the intellect, which fails to perceive really existent distinctions. The critic is a critic only in so far as he perceives distinctions, and consequently disparity, between objects which another takes to be identical. We call a man well-bred, or refined, in the social sense, who in every circumstance of life knows how to adapt his demeanor to the various individuals he meets with: but this he cannot do unless he can appreciate differences of character and of circumstance. The rude and unobser-

vant treat all alike, under all circumstances, as though no differences existed. A man of refined *moral* sense is he who, in judging of what is due to each individual, makes the nicest distinctions: and, on the other hand, the less accurate the distinctions a man makes in moral questions, the more one-sided, prejudiced, and vicious he will be.

Accordingly, the lowest stage of intellect is characterized by a lack of many distinctions which are found in higher stages: or in other words by the absence of many objects possessed by the higher stages.

As compared then with a well developed intelligence, one which is undeveloped has a very contracted sphere of objects. The world it inhabits, its object-world, must be very narrow and restricted. Consider only the grade of intelligence which animals attain, and the number of objects which they have: both stand equally low. The intellect of the child is less developed, logically and ethically, than that of the adult; and the reason is, that the objects of the former are inferior to those of the latter, whether as regards their number or their value. The child is yet ignorant of those things which are the objects of the adult. Abstract conceptions, such as virtue and vice, are strange and incomprehensible to him. His conceptions are all of a concrete nature, such as are given him in his *world;* and this world is restricted to the nursery, to his home, or to the town in which he lives, all regarded as objects of sense. His world widens by degrees, but it is only by becoming engrossed with still new objects, that he reaches the stage of culture attained by his times or by his nation. If these objects had not been presented to him, he would have remained a child all his life, as far as intellectual growth is concerned. The child's world is contracted, and so is his intellect: but this world of his lies immediately within the compass of a larger world. Betwixt the two there exist most intimate relations, and an uninterrupted commerce, and hence the child's world and intellect are ever expanding.

But in the case of the savage there is no such commerce between his little world and the great world around, and hence he fails to advance beyond a certain degree of sensuous apprehension. When our child has made some progress in the formation of sensuous conceptions, he comes in contact with a whole world of abstract and scientific notions, which are instilled into his mind at school. He learns reading and writing, and hears of heaven and earth, and of foreign countries and nations. The results of centuries of laborious study are set before him on the blackboard, as it were. His will also is disciplined and his passions controlled; he is taught how best to shape his conduct, and hence he is not under the necessity of making a long series of painful experiments. But these intellectual notions and objects are utterly wanting in the world which surrounds the savage. His whole life long he continues in the stage of mere sensuous apprehension; and even this will fail to furnish him with as many objects as the child possesses: for we can contemplate only that which is within our world. What then does a savage see, an Eskimo for instance? Ice and snow, bears and fishes, and—Eskimos. Nothing more; for "the whole expanse of Greenland is in great part covered with ice from 2000 to 3000 feet in thickness, as we judge from the height of the fragments of glaciers dropping into the sea." Nature therefore presents to the contemplation of the Eskimo no objects, save ice: there is no change, but everlasting sameness; and man too remains unchanged and undeveloped. With regard to the Eskimos, Captain Parry says that they are not aware that there is any world different from their own, or that Nature may wear an aspect other than that with which they are familiar. The savage's world is narrow, the number of his objects contracted, and therefore is his intellect undeveloped.

Hence the broader the world in

which a man lives, and the more his various conceptions are multiplied, the better equipped is his brain for the exercise of thinking: and *vice versa*, the narrower his world, and the fewer his conceptions, the less practiced is his brain in making distinctions, and the less able is he to *think*. It is a truth confirmed by every one's experience that the thinking faculty, like every other, needs practice to give it dexterity; and that unless it is rigorously and continuously exercised, it will still lack expertness, no matter what may be the natural advantages. If a man begins to be a student at forty, without any previous acquaintance with books, he sets a task for his intractable brain which it is still as ill-fitted to perform, as a Chinese lady with compressed feet would be to dance like Pepita. For "passé cet âge, les opinions sont faites; quant aux fondements, ils sont bâtis, maçonnés, inébranlables; autour d'eux l'habitude, la paresse d'esprit, les occupations pratiques sont comme un ciment que rien ne peut dissoudre." *

Bearing these principles in mind, let us consider the state of some wretched savage, some native of Tierra del Fuego, for instance. He has never come in contact with civilization, has never heard of abstract terms, nor knows anything of the outer world, which for him is undiscovered land, as was the New World for Europeans before Columbus's times. He knows only the barren deserts of his native home, where there are neither towns nor houses. He has never entered a school; and his only desire is the gratification of his hunger, his lust and his indolence. His conceptions are all sensuous, nor are these numerous, being such only as come to him from the few miles of territory around him—from arid wastes and bare rocks, from birds and fellow-savages. Hence the number of his concrete notions is very small; nor can it increase, for he never quits his native place and never sees new objects. The necessary consequence, on psychological grounds, is that he is unable to apprehend or to think like a civilized European. It is for this reason that the instruction conveyed to savages by the missionaries is received by them "as meaningless words, and quickly absorbed into their fetichism, without producing any lasting effect." * Their power of apprehending must be exceedingly feeble, and they "will not trouble their brains with nice distinctions." † Now we can understand why it is that "thinking is a very laborious exercise for the savage;" and also why it is that "when he is questioned as to intellectual things, he quickly complains of weariness and headache." ‡ The thinking faculty of the Bushman is unable to seize the simplest ideas and is characterized by extreme stupidity. § The Abipones, who are more advanced in culture than the Bushmen, have numbers only as high as *three*. *Four* they express by three-and-one; *five*, by the fingers of one hand; *ten*, by those of both hands; *twenty*, by the hands and feet: but when the number exceeds twenty, they express it by taking up in the hand an indefinite quantity of sand. ‖ The Corannas experience difficulty in counting beyond *three*; ¶ a nation in Guinea has numbers as high as *five*,** and some Brazilian aborigines, as high as *four*: whatever exceeds that number is

* Taine, Les Philosophes Classiques du XIX. Siècle en France.

* Bastian, S. 102, *Aumerkung*.

† *Ibid.* 143. This does not imply the incapacity of a savage's child, when instructed, to attain a higher degree of intellectual culture. "The negro is tolerably apt to learn, but his whole development depends on the first instruction he receives. When taken into the factories, his brain is a tabula rasa, but ready to receive new impressions." (Bastian, 140.)

‡ Burchell, Travels in the Interior of S. Africa, II. p. 307.

§ *Ibid.* I. 338.

‖ M. Dobrizhofer, Historia de Abiponibus. Vienna, 1784.

¶ Campbell, Travels in South Africa, 71, 281.

** Bowdich, Mission to Ashantee, 542.

many.* It is difficult for us to imagine ourselves in so lowly an intellectual status as this : but that such status is possible, we may see in the analogous case of young children, who are unable to appreciate a number when it exceeds four or five. But the American Indian, whose world possesses a greater number of objects, and who is continually engaged in the struggle with wild beasts and other foes, leads a more active life. As he has more objects, so he has a greater number of conceptions, and hence his intellectual power is greater. Still his conceptions are little better than mere sensuous impressions. Now these impressions he is receiving daily as long as he lives, and it is no wonder if in distinguishing between them he acquires a degree of acuteness which we lack, owing to our being more taken up with abstract notions. Hence the Indian's nice discernment of scarcely perceptible tracks on the prairie, and of scarcely visible signs in the primeval forest. Hence, too, his power of taking in notions that are somewhat abstract: though this power of his must not be exaggerated. "In North America many Indians can count up to a thousand by scoring ; "† but only up to a thousand, observe, and that only by scoring. Some African nations use the numbers *five* or *six* as the basis of their numeration, instead of *ten*, so that *five-and-two* or *six-and-one* will express seven.‡ It is plain that these tribes must lack all the advantage derived from numeration. They cannot reckon : and yet without reckoning according to the four simple rules of arithmetic, commerce is impossible. It is impossible *suum cuique reddere* without some system of measurement, and this requires numeration and reckoning.§ Hence simply for the reason that their numeration is defective, apart from all other reasons, savages fail duly to appreciate the difference between *meum* and *tuum*. It needs no words to show that they totally lack all such scientific knowledge as is based on measurement.

"They are wont to make an inexact division of time into moons and days, and many of them are ignorant of any division save the diurnal. The day they divide according to the sun's course into three or four parts of indefinite length."* Chronology they have none, nor indeed is such a thing possible among a people whose memory scarce goes back of yesterday. † The mere narration of historical facts were therefore an impossibility for them, even if they had a history. But as their lives are uneventful, they furnish no material for history. Let us consider what events transpire among them that might be deemed worthy of remembrance. The day opens ; they feel hungry ; they take some game ; they sleep : then they repeat *da capo*. "Though the American Indians resemble the natives of Africa and of the Polar Regions in their distaste for work, they differ from them in this that they love repose above all things ; while the others rather love to give themselves up to sport and enjoyment. The Indian never exerts himself, except where exertion is unavoidable , and when the hunt is over he enjoys undisturbed repose in his hammock."‡ Hence the life of the savage is uneventful, monotonous, stagnant. The individual may be developed to a certain degree ; but not so the tribe. "The total development of all the successive generations of a Bushman stock is little more than the development of the first Bushman." § "Some tribes have legends and ballads recounting sundry warlike exploits of their forefathers, but these records do not refer to

* Eschwege, Journal von Brasilien, I. 168.
† Wuttke, Bd. I. S. 156.
‡ Th. Winterbottom, Acct. of the Native Africans in the Neighborhood of Sierra Leone. Lond. 1803, p. 230.
§ *Cf.* Kuno Fischer, Logik, 2, Aufl. § 94, ff.

* Wuttke, I. S. 156.
† Bastian, S. 100.
‡ Wuttke, I. S. 164.
§ *Cf.* the Author's work "Die Thierseele." Leipzig, 1868, Cap. I. § 2.

events of any antiquity. Most savages are as destitute of historic records as though they were the primitive stock of mankind, and just sprung into existence. The Greenlanders, who stand considerably above the lowest grade of savagery, have, instead of history, only genealogies, oftentimes of ten generations."* Similar genealogical lists, but not so long, are found among Negroes, Indians and South Sea Islanders: but never actual history. In fact, they regard the past as very unimportant; and even those among them whose intellect is somewhat developed prefer legend to history.

As the world of such savages is extremely narrow and circumscribed, the number of conceptions formed by them is necessarily very scanty. Their notions are merely of the things of sense, and they *think* not at all—if by *thinking* is meant the elaboration of conceptions not immediately referable to sensible objects. He who entertains no thoughts is unable to give expression to thoughts. Hence, from the conditions of life amid which savages are placed it flows as a necessary consequence, that their language will be as undeveloped and as scanty as their circle of conceptions.† They can have words only for those objects of which they are cognizant. But as these objects are but few; it follows that their vocabulary must be scant. Then, inasmuch as they have no abstract notions, they cannot have any words to express objects not directly perceived by the senses. In the next place their language will be very deficient in those formulas which simply indicate the mutual relations of objects, as recognized by the human mind, and hence will lack inflexions, conjunctions and prepositions. Accordingly the Negro languages are generally very defective: the language spoken in Acra and in Fanti has neither adverbs nor prepositions: neither a comparative degree, nor a passive voice.* From this we may conclude that the people who speak these languages are still ignorant of some of the most elementary distinctions between conceptions, and that they remain through life in the same low stage of intellectual development in which children among us are found when they are learning to speak. It is stated that the Bushmen of South Africa are not distinguished from one another by separate names,† and Herodotus makes the same statement as to a tribe dwelling in the Sahara, the Atarantes: "They alone of men, so far as I can learn, are without names." ‡

Inasmuch as the circle of their conceptions embraces only sensible objects, it is to be expected that on the whole they will discriminate more nicely between such objects than we can, provided a considerable number of them come under their cognizance. The reason of this is that their senses are constantly exercised, and that they have no abstract notions to divert their attention. Hence the North American Indians perceive distinctions, and mark these distinctions with special names, where we use one general term. Thus, for instance, in place of our one verb "to go" they have many words, one signifying "to go in the morning," another "in the evening," another "to go in moccasins," etc. Everything is viewed as unique and individual, and as though it had no connection, no relation with other things. This is owing to the fact that the savage does not compare his conceptions with one another, a process performed not by the senses but by the intellect. Hence it is that the languages of the Indians abound in sesquipedalian word-combinations to express purely concrete notions. But these combinations

* D. Cranzen's Historie von Grönland Barby, 1762, I. 261.

† *Cf.* Steinthal, Die Mande-Neger-Sprachen, psychologisch und phonetisch betrachtet. Berlin, 1867.

* Bowdich, p. 470.

† Lichtenstein, R. um südl. Afrika (1803–6), I. 192, II. 82.

‡ Herodot. IV. 181. *Cf.* Plin. Hist. Nat. V. 8.

are as void of intellectual suggestion as they are minute in describing every outward aspect and every minor particular of the object; and this very minuteness so fatigues and distracts the attention, that the main object is often obscured and hid from view. Awkward story-tellers have the like habit. Instead of going direct to the kernel of the story, they ramble away from it, and go into such long and minute explanations, that at length they do not themselves know what they had intended to communicate.

This redundancy of words is really a sign of a weak and uncritical understanding, unable to handle all its material by the principle of unity. Each phenomenon as it appears is taken to be *sui generis*, and is designated by a special name. Hence such languages, dependent as they are on the slightest external changes of objects, must be themselves ever changing, and the more so, as they are not fixed in writing. "In South African villages, where the children are left by themselves for months at a time, they often are found, when their parents return, to speak a language unintelligible to the latter, and the missionaries have observed that this language of the children is different for almost every generation of them. Among the Australian tribes, who taboo every word whose sound could remind them of a dead relative, and substitute a new term, this change of language must be of still more frequent occurrence. The savage coins new words as he needs them; and when the laws of grammar will not bend to his purpose, or when he is ignorant of them, he makes laws to suit himself. So long as languages are not consolidated and fixed in writing, they are ever in process of construction: and the elaborate grammars written by the old missionaries with the assistance of their ingenious penitents would be as unintelligible to the latter as the systems of religion attributed to them." * "The American languages, generally rich in grammatical forms and in compound words, but poor in expression, because the Indians do not think, are such incoherent conglomerates that when families or tribes break up, a notable divergence of language among the sundered fragments is the immediate consequence." * The reason of this is that each of the fragments finds itself amid conditions differing, if only slightly, from those surrounding the others. As the objects differ, so will the conceptions, and the languages in the same proportion; for *mind* and *world* are dependent on one another. Whenever a savage tribe is not tied down to its native soil by its possessions or by some law of necessity, and wherever its migrations are not checked by the previous occupation of the surrounding country, it readily breaks up into smaller clans, and each one of these will soon have its peculiar dialect. This is the case in America; and Prince Max von Neuwied gives specimens of thirty-three different North American languages which he himself had met with.† In what was once Spanish North America there are over twenty, and in all America about 500 languages entirely different from one another.‡

* Bastian, S. 38, 39, 40.

2. *The Morality of the Savage.*

We have seen how narrow and contracted is the intellectual sphere, the mental horizon of savage tribes, owing to the circumstances by which they are surrounded. Their mental power is not greater than that of the child. But besides mind, man is also possessed of will, and it is will that constitutes his moral character. Our present task therefore is to study the operations of the savage's will, his moral character.

* Max von Neuwied, Reise in Brasilien, II. S. 213.

† *Ib.* II. 445–645.

‡ Humboldt, Essai polit. I. 352; Adelung und Vater, Mithrid. III. 2, 370; V. Neuwied, II. 302; Beechey, Voy. to Pacific, II. 139. For Negro languages *cf.* Bowdich, 454.

Man's will cannot aim at an abstraction, or at the indefinite, but must always have its determinate object. In this it resembles the understanding, which must also have a definite object. But if the understanding has no conceptions, the will can have no objects; for only that which is the object of the understanding can be an object of the will. Hence the savage can desire only those things which are found in the world of which he has cognizance. But this world is different for different races: for one, it will contain many objects; for another, but few. As for the savage, his world is very contracted. Let us now consider what must be the effect upon the savage's will of a greater or a less number of objects.

That can be an object of will which is perceived by the understanding. The first object which a man is conscious of, and the one which, as being inseparable from himself, he must always have, is himself,* his own organism, and whatever necessarily has its rise in it. Man is an organism: whatever originates in this organism and becomes an object of consciousness—*e. g.*, the natural instincts and appetites (hunger, lust, desire of repose)—must necessarily be also an object for the will; and these objects of the will must exist in all men, whatever their culture, simply because man is an organism. But to these objects which are common to the whole race, others are appended which vary according to the conditions of life in which a man is placed; and in proportion as the world around him is rich or scant in objects, diversified or uniform, his consciousness will take in more or fewer objects.

Hence the objects of will may be divided into two classes: first, those which are inseparable from the organism, and which we may call the Instincts; second, those which are found in the world without. Man wills both of these: still it is clear that, all things else being equal, a man will expend less will-force upon individual objects, in proportion as their number is greater. Further, it is clear that in proportion as he exerts his will in one direction, he relaxes it in another. Hence the greater the number of objects found without the organism, and the stronger the energy of will with which they are desired, the more is the will withdrawn from those immediately connected with the organism, that is, from the natural instincts. Conversely, too, the fewer objects a man has, derived from the outer world, and the less his will is attracted by these, the more will he be controlled by his instincts, and the more time and attention will he devote to the gratification of these. Hence it is no wonder if the so-called civilized man controls his instincts more easily than the savage, seeing that his will is directed toward so many objects outside his organism. But on the other hand, we need not be surprised at finding savages, who are controlled by these instincts, committing excesses in the gratification of them, which to us appear to be brutal and shameless.

The savage has no intellectual objects, and consequently no intellectual occupations. He can occupy himself only with such objects as are given to him in consciousness; hence only with such as remain after we shut out all intellectual objects, viz.: hunger, lust, indolence. As objects in the external world he has none, or but few, he cannot occupy himself with them.

When he has appeased his hunger, there is nothing more for him to do, so he will play, or sleep, or engage in debauch; and as this is the only course open to him, he will go to excess. He must needs act thus, nor can he do otherwise; and surely that is not to be accounted a crime in him, which is the necessary product of his natural condition. The unrestrained gratification of natural instincts is as clearly right in the savage (taking his

* *Cf.* Schopenhauer, Vierfache Wurzel, 3 Aufl. § 22.

world into account) as it would be wrong in us, whose world is very different from his. Hence morality, as interpreted by us, has no application to the savage. Our refined distinctions in question of morals do not exist for him: his obtuseness of understanding is such that he cannot grasp them. Our definition of *good* and *evil* applies to him as little as to beasts, and it were unjust to measure him by such a standard, or to require him to conform to it. He can recognize no law save that of instinct, so long as his world remains contracted. Whatever his instincts require, that he seeks; what they reject, that he avoids. As his will is attached to trifling objects, they being the only objects he possesses, he must needs esteem as highly things of no value to us, as we esteem things of high importance to us, though of no account to him. Hence matters perfectly indifferent to us will have for him moral importance (if we may so speak); and conversely, what we take to be highly important will be indifferent to him, because his will is not directed toward it. By the aid of these principles we can explain such traits as the following: Certain Bushmen, being asked by a European what they meant by good and what by bad, could not give any reply: but they held fratricide to be perfectly harmless.* The Kamtchatdales hold that an act is sinful which is unlucky: for instance, to visit hot springs; to brush snow off the shoes out of doors; to seize a red-hot coal otherwise than with the fingers, when you would light your pipe, to bring home the first fox you have taken; to tread in the tracks of a bear, etc.† The Orangoo Negroes hold it sinful to spit on the earth,‡ while the natives of Labrador regard nothing as sinful save only the murder of an innocent man.§

In the gratification of his indolence, hunger and lust the savage can acknowledge no restraint, as he has no outward objects to counterbalance them. But here another point is to be considered, namely, that this unrestraint tends to grow from day to day. Egoism prompts each individual savage to assert his mastery over all others. Hence the quarrels and competitions of man against man, each striving to surpass the other. But since this competition must regard only those activities which occupy the savage, and as these three instincts furnish his chief occupation, it follows that the natural condition of unrestraint will be carried by competition to a truly bestial degree of perfection in indolence, gluttony and lust. The Missouri Indians used to practice promiscuous intercourse as a point of honor.* In like manner, in Tahiti and the adjacent islands, there was the association of the Arreoi, who made it a point of honor to practice unchastity in all its degrees.

The Indian never exerts himself except so far as strict necessity requires. After the hunt, unbroken repose. The women do all the work, as is the universal rule among savages. "An Indian chief once said to a white man, 'Oh, brother, you will never learn what happiness it is to think of nothing and to do nothing: this is, next after sleep, the most delightful thing on earth. That was our condition before we were born, and will be our condition after we die.' Then, after expressing his contempt for the restless life of the white man, he went on: 'But we live for the present moment. The past is but smoke driven by the wind. As for the future, where is it? As it has not yet come, we shall never see it perhaps. Let us then enjoy the day that is, for to-morrow it will be gone far from us!'" † It is plain that among such people, to whom the past has bequeathed no problems to be

* Burchell, I. 338, 340.

† G. W. Steller, Beschreibung von Kamtschatka. Frankfurt und Leipzig, 1774, S. 274.

‡ Bastian, 261.

§ Nachrichten aus der Brüdergemeinde, 835, No. 5.

* M. v. Neuwied, Nordamerika, II. 131.

† Crevecœur, Voy. dans la haute Pensylvanie et dans l'état de New-York. Par. 1801, Vol. I. p. 362.

solved, no tasks to be performed, and who will themselves bequeath none to futurity, there can be no advance in knowledge or in morals. "The boy accompanies his father: if the latter follows any pursuit—fishing, for instance—the son too learns the craft. But inasmuch as the Negroes pass the greater part of their time in doing nothing, the education thus obtained is of no importance." * In the South Sea Islands the grandees have the food put in their mouths bit by bit.† In Tahiti the missionaries, having endeavored to introduce the art of weaving, all the girls who had come to learn quit work after a few days, saying, "Why should we work? Have we not as much bread-fruit and cocoa-nuts as we can eat? You who need ships and fine clothes must work: but we are content with what we have." ‡

Lust and gluttony are regarded by all savages as the acme of earthly felicity. The inhabitants of Northern Asia perform wonderful feats of gormandizing. Three Yakuts will devour a reindeer at one meal, including the contents of the intestines, and a single Yakut once devoured 28 lbs. of porridge with 3 lbs. of butter.§ The baptized Kamtchatdales often say, as they recall the past when they were still heathen: "When do we ever have jovial days now? Time was when we used to bespew the whole floor of the hut three or four times a day, but now we can do it but rarely even once a day. Formerly we could wade ankle-deep in spew, now the soles of our feet even are not wetted."‖ "In all Negro languages the word *belly* is one of great import."¶ Politeness requires that one inquire if all is well with his neighbor's belly. The South Sea Islanders call thoughts, *words in the belly*. The stomach of one who dies is kept as a relic; and the Kroo Negroes hold that the stomach ascends into heaven after death.*

As regards the passion of lust, the absolute shamelessness of the savage almost surpasses belief. The Bushmen have only one word to signify girl, maiden and wife; they consort together like cattle, have no real marriage, and the men exchange their women freely.† "Woman is a chattel, to be bought and sold, having no rights of choice or of refusal. Being a mere possession, not the object of love, when by reason of age or for any other cause she can no longer minister to lust, she becomes a despised thing, without any rights, often contemned even by her own children, shut out from the ceremonies of religion, oftentimes even forbid to come near the sanctuary as being unclean, and in death she is esteemed unworthy of being lamented."‡ "In Nucahiva the bride is the property of all the male guests for the space of three days."§ Bushmen and California Indians make no account of blood-relationship, and incest is common among many Indian tribes.‖ Among the Aleutian Islanders brothers and sisters, children and parents, have sexual commerce with one another, alleging the example of the seal.¶ South American savages, the Puris, Botokuds and others, and most of the New Holland tribes, go entirely naked, while among the South Sea Islanders, at least the men, if not both sexes, wear no bodily covering. Some Indian tribes use clothing to protect them against the weather, but disregard the claims of modesty.** Sodo-

* Halleur, das Leben der Neger West-Afrikais; Ein Vortrag. Berlin, 1850, S. 31. *Cf.* Bosmaun, R. nach Guinea, 1708, S. 148.
† Forster, S. 206.
‡ Beechey, I. 337.
§ Cochrane, Travels on Foot through Siberia, 155; J. Sarytschew, Achtjährige Reise im nordöstlichen Sibirien, auf dem Eismeere u. dem nordöstlichen Ocean. Aus d. Russischen übers. Leipz. 1805, I. S. 129.
‖ Steller, Kamtschatka, S. 286.
¶ Bastian, S. 35.

* *Ib.*, S. 207.
† Lichtenstein, R. in Afrika, II. 376; Campbell, 13.
‡ *Cf.* Wuttke, I. 177.
§ Langsdorff, Reise, I. 132.
‖ Eschwege, Journ. v. Brasilien, I. 121; Mackenzie, Travels through N. America, 108.
¶ Langsdorff, II. 5843.
** Mackenzie, 5471. *Cf.* Wuttke, I. 182.

my is wide-spread in certain tribes.* The South Sea Islanders abandon themselves at a very early age to the most unbridled licentiousness; and their songs, dances and shows are instinct with sensuality.† The Tungoos have wanton dances which conclude with the stripping off of all clothing and indulgence in unlimited debauchery;‡ and immoral dances prevail throughout all Northern Asia.§ The Greenlanders and Eskimos are notorious, but the life led by the Kamtchatdales in former times was bestial. All their thoughts and imaginations were concerned with unchastity, and even little children delighted their parents by licentious indulgence. Adultery was universal, and the women used to boast of it. Strangers were required to make return for any service they received, by ministering to the ruling passion; and men and women engaged in unnatural and sodomitic commerce. They were acquainted with syphilis, as they themselves admit, long before the advent of Europeans.‖

Where there in no moral family life there can be no family, in our sense of the word, that is, with the members united together in love and friendship. Here the rule of the stronger prevails, and the man is everything. "The idea of the State is nowhere¶ developed, and the individual, instead of gaining strength from union with others, imagines himself to be safe from danger only when he oppresses all around him. The father makes slaves of his children, and the husband enslaves the wife, in order that he himself may be free: and he is free so long as he does not meet some one mightier than he, for then the domestic tyrant falls himself under the control of an inexorable master. His neighbor he regards as his foe. In short, nothing can be more foreign to the savage mind and the state of savagery than the dogma of Universal Equality."* "The child has no rights, being simply the chattel of his parents, who can do with him as they please, without being bound to him by any obligations. Rarely do they exhibit any true parental love for their children, beyond the fondness of animals for their young; and when a child is born to them inopportunely, or when they take a dislike to it, it is put to death; and the fearful crimes of infanticide, fœticide, abortion, abandonment and sale, and even slaughter and eating of children, are so common as to explode all the sentimental idyllic tirades that have ever been sung about the innocent life of man in the state of nature."†

When such are the relations between parent and child, education is out of the question. The American Indians are pleased when they see the child strike its mother and refuse to obey her. "He will one day be a brave warrior," say they. Among them obedience and respect for parents are very rare.‡ Among the Kamtchatdales children never ask their parents for anything, but take it without more ado: and they never manifest joy on seeing their parents after a protracted separation from them.§ Among the Tungoos duels between father and son are frequent, and not seldom terminate fatally.‖ The Arekuna, as in Guiana, bring up children and monkeys together. The monkeys are members of the family, eat with the other members, are suckled by the women, and have great affection for their human nurses.

* Eschwege, I. 132; Franklin's First Voyage, 7273.
† Mackenzie, 108.
‡ Ermann, Reise um die Erde II. 36.
§ Cochrane, 298.
‖ Steller, Kamtschatka, 287, 350, 357.
¶ Among savages.

* Bastian, S. 67, 68.
† Wuttke, Gesch. der Heidenthums, I. S. 185.
‡ M. v. Neuwied, Nordamerika, II. 129; Mackenzie, 106; Franklin, First Voy. 73; Eschwege, I. 121; Spix u. Martius, Reise, I. S. 380.
§ Steller, Kamtschatka, S. 353. *Cf.* Wuttke, I. 187, ff.
‖ Georgi, Beschr. einer Reise durch das Russische Reich im J. 1772, S. 242. *Cf.* M. v. Neuwied, R. in Brasilien, I. 141, 146.

Oftentimes a woman is to be seen with a child and a monkey at the breast, the two nurselings quarreling.*

As the parents care little for the children, so in turn the children care little for the parents. When the American Indians go out on their hunting expeditions they often leave behind in a state of utter destitution the aged and the infirm who are unable to make the tramp:† and in most of the tribes it is customary for relatives to dispatch the old and the feeble without remonstrance from the victims.‡ The Bechuanas have less regard for the aged than for cattle, and abandon them to their fate without compunction.§ Their neighbors, the Corannas, expose the old people to wild beasts, they being, as they say, of no account, and only serving to use up the provisions.‖ Among the Bushmen the daughter often turns her old mother out of the hut, and leaves her to be devoured by wild beasts. Sons put their fathers to death with impunity.¶ The Kamtchatdales often eject the sick from their house and cast them to the dogs;** and the Eskimo often bury alive old sickly widows, and not unfrequently suffer old men to perish of hunger.††

3. *Conclusion.*

We have now set forth the intellectual and moral condition of the savage so far as was needful for our present purpose. Our criticism, aided by experimental investigation, unfolds before our eyes a picture very different from what certain enthusiasts would paint, who hold the present condition of civilized man to be a corruption, a degeneration from the primitive innocence and purity of man in his natural state. An indolent savage, who has neither objects nor aims nor ambitions to occupy his mind, can never be *moral.*

Of course the picture we have painted does not represent with equal fidelity all savages, for there are degrees of higher and lower even in savagery. We are not called upon here to ascertain the specific differences of these various degrees; it is sufficient if we have an idea of the average condition of the savage intellectually and morally considered.

The savage's world is narrow and contracted, presenting but few objects, and hence he has but few conceptions. But the fewer his conceptions the less does he distinguish between them; *i.e.*, the less he thinks, the less is his faculty of thought exercised, and the greater is his stupidity. Then, his will can be directed only upon the objects given him through his understanding. But since external objects there are none to engage it, of course all its energies must be expended upon internal objects, of which he is conscious through his organism. Hence he is as free from restraint as a beast in the gratification of his instincts. Such is the savage, and such he must be; for intellect, world and will are inseparable; one never stands without the others; they stand ever together, or they exist not at all. It is needless to inquire which has precedence, for they all three make up the essence of man. His intellect extends as far as his world, and his will extends only so far as his intellect, or his world. Conversely, too, his world extends only so far as his intellect and his will.

* R. Schomburgk in the "Ausland," No. 288.

† Mackenzie, 431; Franklin, First Voyage, 192; Second, 91.

‡ Robertson, History of America, I. 466; Mackenzie, ib.

§ Campbell, Trav. in S. Africa, 49, 245.

‖ *Ib.*, Second Journey, 258.

¶ *Ib.* 272.

** Steller, S. 271.

†† Cranz, Grönland, 201; Beechey, II. 394. Bastian makes a similar statement as to Negroes, S. 320.

CHAPTER III.

THE RELATION BETWEEN THE SAVAGE MIND AND ITS OBJECT.

In the preceding chapters we have been laying the foundation for a correct understanding of fetichism, and have ascertained the range of the savage intellect. As fetichism is really a mode of intellectual apprehension, we had first to study that particular phase of the understanding wherein a sensible object obtains significance as a fetich. It remains for us now in the present chapter to show what is the necessary relation of the savage mind to its object; for it is this relation which gives rise to the fetichistic apprehension of objects, and which accounts for it.

1. *The Value of Objects.*

As things are for us what we apprehend them to be, so their value for us will be in accordance with our apprehension of them. Now the mind has a clearer and more exact apprehension of objects in proportion as it distinguishes between them more clearly. Therefore the sharper the distinctions we can make with regard to the minutest details of an object, the more exactly can we determine its value. An object is distinctly apprehended, only when we can discriminate between it and other objects. If therefore I would form a clear understanding and an accurate estimate of a thing, I must also clearly understand all other objects related to it; and so I cannot rightly estimate anything without an acquaintance with a number of other things. My estimate of things will thus vary according to the number of objects of which I take cognizance. But since all things stand to each other in a causal relation, it follows that a *perfectly* exact estimate of any single object can only be had when the entire series is known. For the greater the number of the objects apprehended, the better do we understand the interrelations of them all, and so the causal value of each. On the contrary, the smaller the number of objects, the less accurate will be our estimate of each.

The mind, then, whose object-world is very contracted must of necessity form a very different estimate of things from that formed by a mind which has many objects, nor will its estimate be as exact as that of the latter. From all this it follows that the estimate formed of things by children as well as by savages must be very different from our estimate, as their world is very contracted and the number of their objects very limited.

The untutored intellect which, as having but few objects, is defective in the power of distinction, cannot estimate the true value of things. It is liable either to overestimate objects or to undervalue them. It can estimate only the objects which it has. As it knows only these and is ignorant of all others, it cannot compare the known with the unknown, and the known must of necessity be esteemed the best and the most precious. The peasant who has never left his native soil, regards his home as the most desirable place on earth, though the soil be half bog. Be the objects which the untutored mind contemplates never so lowly, and worthy only of contempt, as viewed by a mind which has a wider range, still it will set an exorbitant value on them inasmuch as they are the only objects it contemplates. On the other hand, as there are many objects which do not occur to the undeveloped mind (*v.g.* objects of a purely intellectual value) these it will not estimate aright, or in other words, not according to their true worth. It will undervalue them. The peasant values his field of rye, not so the rare varieties of flowers growing in the neighborhood; he knows nothing about these. If his mind were stored with as many plant-objects as is that of the botanist; if he were acquainted with their different classes and their mutual relations, he would value these rare flowers: as it is, he plucks them up as weeds and

casts them away. His undeveloped understanding does not apprehend distinctions between things, and as he cannot distinguish between them, they are all alike to him. For him leaves are leaves, and he knows no such distinctions as heart-shaped, lancet-shaped leaves, etc. Objects with which he is unacquainted he undervalues in proportion to his ignorance of them.

The fewer and less important the objects which a man possesses, the more excessive will be his overestimate. He will discern valuable treasures in trifles which, to a mind of greater range, will appear as very nothings. If a man is worth a million of dollars, a few pence will be a trifle in his eyes; but if a man has only a few pence, then one penny will have a considerable value for him. If then we would determine what are the objects which a man will regard as valuable, we must take account of how many objects he has. What then are the objects that a child will prize? Those which he has. What are these? Let us consider those which he *has not*. He has none of those which lie within the domain of science or of art. He has none of those things which the adult values, steady occupation, its products, its remuneration, etc. He values only those things which he knows and has, and these are the merest trifles, his playthings.

Children must of necessity prize these trifles, for they have no knowledge of the more important objects known and prized by adults. It is worth while to observe how the understanding is enlarged in proportion to the number of objects to which it addresses itself. As it becomes acquainted with new and more important objects, its standard of values changes; yet so long as these new objects are unknown, it esteems as most important those objects which it already has. In youth we have a very different estimate of things from that which we have in old age, for youth does not value those things which are most prized by age. In like manner the child does not value the objects which are of importance to youth. The child values only the objects with which he is acquainted. But these must be of but little importance, for it is only by slow degrees that the mind comes to value objects of real importance. Inasmuch as every object is a novelty to the child, it is a necessity for him to take the same interest in trifling objects which we take in more important ones. The child is receiving an education, and has enough to occupy his mind in the contemplation of familiar household things. For these alone he has eyes, ears, attention. After a man is grown up and no longer admires, for instance, his watch, merely glancing at the dial to ascertain the time of the day, he forgets the time in the past when things now the most familiar were to him new and strange, and wonders that the child should want to look at the watch again and again, and to listen to its ticking. Yet nothing is more natural or more inevitable for as yet everything is a novelty to the child. We say that children *play* with things. If by *play* we mean simply pastime, amusement, we do not correctly describe the occupation of the child, who is as seriously employed with his toys as an adult might be in the management of state affairs. The child's play is work, study, acquisition of knowledge, and occupation of the mind suited to the measure of his faculties.

We have been somewhat prolix in describing the relation of the infantile intelligence to its objects, for the reason that it throws light upon the matter in hand, viz., the relations between the mind of the savage and its objects. The savage's mind is in the same embryonic state as that of the infant. It has but a limited range of objects, and therefore will value these, however inconsiderable they may be, as we value objects of greater moment. Let us take an inventory of the possessions of a naked savage, a Bushman, for instance. He has none of the products of industry or art; he weaves not, neither does he spin; he neither

plants nor gathers in a harvest; he has not even a knife beyond some sharp-edged stone he chances to find. He knows nothing of such objects. Previous to his coming in contact with Europeans he has no idea of such a trifling thing even as a brass button, or a nail. What then does he possess? A few articles that he has chanced to find, that he has picked up off the ground, or found growing on trees, or taken from wild beasts. His possessions consist of stones, shells, a club, fruits, peltries, a dead carcass, skulls and bones, teeth, horns, gaudy feathers, fishbones—such is the sum total of his property. "The Bushmen have scarcely any possessions. If they steal a few head of cattle, they devour as much as they can, and leave the remainder on the ground."* The negroes of West Africa are more favored. "Simpler even than his house is the furniture—a bed made of leaves and rushes, a block of wood for a pillow, a few pots and bowls, a gun and a long knife, with a few large and small calabashes, the large ones used as wardrobes (his clothing being a few yards of cloth to wrap around the body), and as receptacles for ball, lead, powder, etc.; the small ones serving as flagons. And that is about all the furniture to be seen in a negro's hut." †

Beyond this inventory the savage neither has nor knows of any possessions. He must therefore overestimate these objects. Accordingly a fishbone will serve him for an ornament.‡ "They trick themselves out with feathers, shells and the like, which they consider things of beauty."§ If now they meet with some strange object, a nail, for instance, or a glass bead, or a bit of tinsel ornament, it excites their wonder, and they long to possess it. "The sister of a South Sea Island king whose subjects thought themselves highly civilized, stole a couple of iron nails from Cook's vessel, and her brother connived at the theft."* "A negro who wears European clothing at once ranks with Europeans, though he be as black as coal. There are gradations of rank, however: a fellow that wears only one article of European costume, the vest, for instance, or the hat, ranks as a mulatto. To hold rank as an out and out European, he must wear the full costume, his head being crowned with the hat." † "Oftentimes as I stood in the presence of ebon Majesty, the king would be possessed by the god of poesy, and my interpreter would inform me that he was singing my praise and great renown. This was extremely gratifying and of course flattered my vanity in no small degree. Unfortunately, however, my attention was on one occasion specially directed to the noble strains wherein the Greots, or bards, committed my fame to posterity; and it was suggested that the least I might do was to give them a kronthaler: so I had the curiosity to request of my interpreter a more minute analysis of the pæan. The Greots were lauding in transcendental metaphors, my hat, which just then was not according to the latest *mode de Paris;* and in its last days that hat cost me double the price I had paid for it new. The Lord of Shemba-Shemba I suppose sung the praises of my shoes, as shoes in that land are the prerogative of the Blood Royal. Princes alone are there permitted to wear shoes, to travel in mat hammocks, or to carry umbrellas." ‡ The inhabitants of the Pelew Islands used to append to their ears all the valuables they cribbed from Europeans, scraps of leather, bits of paper, etc.

This fact, which has a psychological basis in the intellect of the savage, must be taken into account in the study of fetichism; and this for two reasons, viz.: First, it will, in connec-

* Lichtenstein, Reise im Südl. Afrika, 1803–6. Berlin, 1811, II. 321, 83.
† Halleur, 23, 18.
‡ Bastian, 317.
§ Halleur, 19.

* Forster, Bemerkungen, S. 338.
† Halleur, 19.
‡ Bastian, S. Salv. 56.

tion with other facts, enable us to see how an object comes to be regarded as a fetich. Then it will guard us against the error of thinking that every object that the savage prizes is for him a fetich. It is true, any object may become a fetich; still, every object is not necessarily a fetich. We might here recall what Azara says about the savages of the Rio de la Plata: "When the ecclesiastics saw certain figures engraved or pictured on the pipes, bows, clubs and pottery of the Indians, they at once concluded these were idols, and burnt them up. The Indians still employ the same figures, but only to please the fancy, for they are without religion."*

2. *The Anthropopathic Apprehension of Objects.*

It is plain that in the view of the savage, objects will have a very different value from what they have for us. But furthermore, owing to the contracted range of the savage's mind and his consequent deficiency of mental power, or, which is the same thing, his defective faculty of distinction, an object, whether living or inanimate, will have for him a very different meaning from what it has for us.

The savage differs but little from the mere animal, nor does he himself draw the same line of distinction between the two which we draw. Inasmuch as his consciousness, which extends only as far as the objects which enter it, is extremely contracted, he is on this ground also less distinguished than we from the unconscious nature which surrounds him. He has but few objects, and so distinguishes but few; and thus his power of ascertaining substantial differences between things lies all unemployed, uninstructed and feeble. Consequently, he does not see things with the same distinctness as we do, and hence it is clear that in his view nature must appear more homogeneous than it does to us. But we must consider this point more closely.

We too regard all nature as one and homogeneous, and view all beings as essentially homogeneous, but yet on characteristic grounds very different from those of the savage. After having traveled in many devious paths, and so far even exaggerated the distinction between Man and Nature, as almost to dissolve the tie which binds them together, and thus established the characteristic differences between the two, we came to recognize the truth that in the last analysis man is not essentially distinct from nature, and we regard nature as homogeneous in all its parts, though for reasons very different from those of the savage. The difference lies in this, that we consider nature in its several parts: that we arrive at the knowledge of its homogeneity through the consideration of its distinctions and differences, and that nature lies before us as a very complex object, which has been investigated in many of its parts. The savage knows nothing of these distinctions and definitions: to him nature is all unknown; yet he too regards it as homogeneous, but on these grounds:

He is unacquainted with the peculiar nature of those things he comes in contact with, having never investigated them; he knows nothing of their inner specific properties and constitution. He recognizes a distinction only between their external phenomena, as regards their form, color, smell or taste. Then, he has never made his own being a subject of contemplation either from a psychological or from a physiological point of view. He is therefore ignorant of the distinction between himself and other beings. Accordingly his apprehensions of outward objects will picture them not according to their real nature, which he has never investigated, but in quite different shapes. It is impossible for him to attribute to objects properties he never yet has apprehended. He has no conception of the true, specific nature of things, and

* Azara, Voyage dans l'Amerique Meridionelle. Paris, 1809, T. II. p. 3.

consequently his apprehension of them is defective. Whatever object he perceives he invests with those properties of which he has already a notion, and then for him the two things are inseparable and identical. This process is inevitable, and the savage never doubts but that his perception is entirely correct, for he has no suspicion of having transferred to the object the incongruous impressions of his own mind. And indeed why should he doubt? In order to entertain a doubt whether or no his apprehension corresponds with the reality, the thought must first have arisen in his mind that perhaps the object might be apprehended differently: but this presupposes a mind furnished with a great variety of conceptions, and that has investigated much, so as to be possessed of a number of different actual and possible notions. Precisely because the cultured mind possesses such an abundance of varied notions, any one of which may appear to represent some new object which attracts its attention, it will not accept its first impression as absolutely correct and final, but will be skeptical for a time, while it sifts and weighs, in order to choose among many conceptions that which exactly fits the matter in hand. Now the savage has no such store of conceptions. He possesses but few himself, nor has he the slightest suspicion of any others. As the savage of Tierra del Fuego has no notion of Europe, Asia, Africa, etc., and just as he has not the remotest idea of what a magnifying glass is, so he is utterly unable to conceive of any other mode of apprehension but his own, and therefore he can entertain no doubt as to the correctness of his notions. Having no suspicion of the existence of any notions beyond those he himself possesses, he necessarily thinks his are the only ones possible. The adversaries of Columbus saw, according to the ideas they entertained, that his undertaking was chimerical: they regarded their own notions as the only correct and conceivable ones, and were free from all doubt. Who could have imagined the possibility of traveling by land without the employment of draught animals, before the invention of the steam-engine. It is impossible for the savage to doubt the correctness of his notions, as there are no others by means of which he might set them right. Having no suspicion of any others he is obliged to see all things in the light of his own understanding alone, and to transfer to everything he meets the impressions already existing in his mind.

Hence it is plain that the savage must regard all objects, as far as concerns their inner nature, as being endowed with those inner properties only, of which he has formed to himself some notion. Now what are these? Not the inner properties of the objects themselves, for of these he knows nothing. The only properties of this kind with which he is acquainted are those of his own mind. But how far does his knowledge of his own mind extend? He knows nothing of its psychological laws, nothing of its essential character, so to speak: he is acquainted only with accidental properties: his transient impressions and emotions, his momentary humors, and his aimless pursuits. These notions he necessarily transfers to exterior things, as their inner properties; for on the one hand he has no idea of the real inner nature of the objects, and on the other he is acquainted with no inner properties whatever, save those of his own mind. He must necessarily consider all nature, and not alone animals but even inanimate things, as living, thinking and willing, even as he himself lives and thinks and wills: that is to say, he takes an *anthropopathic* view of nature. We shall in the sequel find abundant proofs of this position, for it is a fact that has been time and again recognized, admitted and proclaimed. We have attempted only to assign its psychological grounds. It is the utter ignorance of the savage that directly leads him to view nature in this light, for we must bear in mind

that for a man in the earliest stage of development, viz., a savage, everything, however trifling, is as novel, as unknown and as wonderful as a rattle is for the infant. As the man gradually advances toward civilization, this mode of viewing nature is given up, yet far more slowly and more grudgingly than we might be disposed to expect. For it is with this habit as with every system of ideas. If those who went before have adopted it, and their whole life long cherished it, and held it for true, it becomes implanted in their children into whom it was inculcated during their early years, and in them becomes a truth, resting on the authority of their ancestors. The belief grows stronger day by day, and finally becomes indisputable dogma which is not to be set aside even though it be in conflict with facts. Thus the anthropopathic view of objects endures even where men's acquaintance with nature is no longer in the lowest grade.

If we transfer ourselves into the narrow field within which the savage observes nature we shall find this result so inevitable, that any other result will appear to be impossible. Though I have said that we ourselves, no less than the savage, must regard man and nature as homogeneous, still we must admit this difference between our point of view and his: by investigating nature we have come to recognize man as a product of nature. We say, man is as the rest of the universe. But the savage knows neither the nature of other things, nor yet his own; as regards the latter, he is acquainted merely with his varying impressions and desires. Therefore he can only say: Nature is like Man, *i.e.*, has the same petty, individual and altogether subjective impressions and desires. When Schopenhauer says, The Universe is Will, for man in the last analysis is Will, and at the same time merely a part of the Universe, he asserts that the common being of *all* men is also the being of the Universe. On the contrary, the savage says: The individual being which pertains to one man, to me alone, to this particular savage creature, with all its petty, personal propensities, is the being of the universe. The distinction is broad. Schopenhauer says: The Substance of man is the being of the Universe. The savage says: Accidental properties (which differ for different individuals) are the being of the Universe.

Thus the intellectual status of the undeveloped man, the savage, necessitates a mode of contemplating nature very different from ours. He ascribes to all things essentially the same properties he possesses himself: he cannot avoid considering all things as being endowed with the same inner properties he discerns in himself, for he has no critical power of discriminating. For him, therefore, every object lives, wills, is kindly or unfriendly disposed; and thus everything inspires him with fear and awe, "so that he scarce ventures to touch any object: even the very plant which affords him nourishment he plucks from the ground with propitiatory rites." * In America and in Northern Asia all things are supposed to be possessed of souls—works of nature and of human art alike. These souls they consider as something dwelling in the object and inseparable from it, which can benefit or harm mankind." † The more these objects resemble man in their general appearance the more readily will they be regarded as actually human. First, therefore, would come the anthropopathic apprehension of animals, then of all the phenomena of motion—the sea, rivers, clouds, the wind, lightning, fire (which some savages regard as an animal,‡ as did the ancient Egyptians, according to Herodotus); § plants would follow next, and then finally rocks and mountains. This subject we will consider in detail farther on. "Natural objects pass for mighty spirits. Thus, for instance,

* A. Bastian, Beiträge zur vergleichenden Psychol. S. 10.

† Meiners, Hennepin, Lafiteau, Steller, etc.

‡ Wuttke, I. 59.

§ Herod. III. 16.

among the Australians the rock-crystal is esteemed sacred; the savage attributes special good qualities to stones of bright colors. The bloodstone is supposed by the Indians of South America to be possessed of beneficent qualities. Even the products of human skill, such as watches, telescopes and the like, are inhabited by spirits. An intelligent Bechuana said, on first seeing the sea and a ship, 'This surely is no created thing, it has sprung into existence of itself, and was not made by man.'"* This anthropopathic view of nature is the very essence of poetry: and hence it is that the view which the savage takes of nature appears to us so poetical, though he himself is so accustomed to this mode of apprehension that he is utterly unconscious of the poetry.

As man can ascribe to objects only those notions and passions which he has himself, the savage attributes to his fetich precisely his own wild, unbridled desires in all their natural unconstraint, and magnified to the highest degree; his hunger and thirst, his love and hate, his anger and his rage. Still the object continues to be, in the mind of the savage, that which it is in its external form. It is not as if the savage in his anthropopathic apprehension represented to himself a self-existent superior Power, a self-existent soul, which merely assumed for a time the external shape of the fetich. No: the stone remains a stone; the river a river. The water itself, in its proper form and with its native properties is invested with anthropopathic characteristics. This is very different from a symbolic conception. Here the object as it presents itself in all its external manifestations, is identical with the anthropopathic conception. When a thing comes to be regarded as in some way the symbol of another and a different thing, then the mind has made a very considerable step in advance.

The object has therefore a greater value for the savage than for us, both as a commodity and as something anthropopathically regarded as possessing life. "One of the followers of the envoy Isbrand exhibited before a crowd of Ostiaks who wanted to sell fish to the embassy, a Nürnberg watch, fashioned in the shape of a bear. The Ostiaks viewed the article with great interest. But their joy and astonishment were increased when the watch began to go, and the bear began to strike the hours, and his head and eyes to be in motion. The Ostiaks bestowed on the watch the same honor they paid to their principal Saitan, and even gave it precedence over all their gods. They wanted to purchase it. 'If we had such a Saitan,' said they, 'we would clothe him with ermine and black sable.'"* "Father Hennepin, during his stay among the savages, had in his possession a compass and a large kettle in the form of a lion. Whenever he made the needle vibrate, the chief with whom he lodged assured all that were present that the white men are spirits and capable of doing extraordinary things. The savages had such fear of the kettle that they never would touch it, without having first wrapped it up in beaver pelts. If women happened to be present, the kettle had to be made fast to a tree. Hennepin offered the kettle to several chiefs as a present; but none of them would accept the gift, for it was thought that an evil spirit dwelt within it, who would slay the new owner."†

The same anthropopathic apprehension of things is to be observed in children. The little girl who in perfect seriousness regards her doll as a playmate, who strips and clothes it, feeds and chastises it, puts it to bed and hushes it to sleep, calls it by a personal name, etc., never imagines that all her care is expended on a

*Waitz, I. 457.

*Isbrand, Voyage de Moscou a la Chine, in Vol. VIII. of Voyages au Nord, p. 38.

†Hennepin, in the Voyages au Nord, IX. 332, 333. *Cf.* Constant, La Religion, I. p. 254

lifeless thing. she does not make any such reflections as these: This is all merely an illusion that I indulge on purpose; a play that I engage in, but with the distinct understanding that it is only play. She has no thought that the doll is a lifeless thing; for her it is possessed of a human life, which is bestowed upon it by the child herself. The boy's hobby-horse is for him no mere symbol. This anthropopathic view of lifeless objects is to be seen among people everywhere. Especially do we observe it in the way people vent their rage in blows and abuse bestowed on inanimate things that have occasioned them some hurt. In the heat of passion, reflection and judgment are silenced, and then momentarily the mental range is contracted as it is in the savage permanently. An Indian who in his cups had received a burn expressed his indignation against the fire in the most abusive language, and then *mingens eum extinxit.**

3. *The Causal Connection of Objects.*

We now proceed to study the operations of the mind in its profoundest depths. The act of consciousness implies the perception of the principle of causality. We *perceive* objects by referring to outward phenomena, as to a *cause*, certain modifications produced in our nerves of sense, and we connect objects themselves with one another by the same causal nexus. In the latter process the mind arranges the objects in a certain orderly series, so that one shall appear as accounting for another, or explaining it. Thus one object would be cause, and another, effect. The mind invariably perceives this relation in all the objects which come under its cognizance; and even in the most trivial conversation the several conceptions are explanatory, illustrative, confirmatory of one another, and so inter-related causally. It is a law of the mind therefore that it shall regard its objects as standing to one another in the relation of cause and effect.

Now it is clear that the mind can discern this relation only between those objects of which it has consciousness. But the more restricted its range, the fewer will be its objects. A mind which possesses but few objects will be liable, owing to this very paucity of objects, to assume immediate causal relations where they do not exist: in the absence of the true cause, it will take for cause some object within its own range. This is the real ground of all error, and any erroneous apprehension whatsoever might serve as an example of what we here assert. In the course of this chapter we shall fall in with many examples, but we cite only the following in this place: The true cause of the so-called rain of blood in Southwestern Europe was long unknown. People accordingly connected this unknown and unexplained phenomenon with a conception which they already had, and said, "It rains blood," and so believed, until it was discovered that the color of the rain was owing to the presence in it of particles of sand from the Sahara.* "When the keel of Portuguese ships first furrowed the waters of the Atlantic, the savages viewed with consternation the white-winged ships driven along their coasts by a power to them incomprehensible." They had never seen a ship. What could this apparition be which was borne along as it were on wings? One only conception had they which could aid them in accounting for the motion, and they said, "They are cloud-birds come down on earth." † It is just because the mind can assign only those objects as causes, which it already possesses, that you hear men uttering so much nonsense when they discourse about things quite

* Adair, Hist. Amer. Indians. Lond. 1775, p. 117.

* M. Perty, Die Natur, p. 283.

† Bastian, S. Salvador, S. 269.

without their sphere, but which they try to explain by conceptions belonging within it. In short, this is the origin of all that science which would account for phenomena by an *à priori* theory, as when the motions of the planets were explained on the theories of Ptolemy or of Tycho Brahe. The common people from their stand-point could account for the occurrence of erratic blocks only on the theory that they were fragments of giants' clubs broken in battle, or that they were dropped by giantesses out of their aprons.† The explanations given by Playfair and Venetz lie quite beyond the popular apprehension.

So much therefore is clear, that the undeveloped understanding will of necessity connect in causal relation a number of objects which do not in reality stand to each other in the relation of cause and effect, reason and consequence. The question for such a mind is, to which of the objects of its consciousness it shall specially attribute causality.

The cause, as being the producer, will naturally be regarded as strong, powerful, effective, and so gifted with peculiar attributes: for only that which is possessed of power can produce. Whatever therefore we regard as preëminent in its kind, whatever appears to us as specially notable, peculiar or important, we rate as the cause of other phenomena which we regard as its effects, if only the circumstances of time and space permit such a view. This perception of causality the mind must get from objects within its own range. Now, as we have already seen, the narrower the mind's range, the higher will be its estimate of objects. Therefore, the more restricted the field of consciousness, the more inconsiderable will the objects be which pass for causes —inconsiderable in our view, though of high moment in that of the savage. If we now recall to our minds what has been already observed with regard to the savage's anthropopathic apprehension of objects, the following example will be readily understood, while at the same time it will serve to illustrate the preceding remarks. An iron anchor must be regarded by the savage as a very strange and peculiar object, for he could never mold such an instrument, nor does he see the like every day. "A Kaffir broke a piece off the anchor of a stranded vessel, and soon after died. Ever after the Kaffirs regarded the anchor as something divine, and did it honor by saluting it as they passed by, with a view to propitiate its wrath."* An anchor is, in the eyes of the savage, something so remarkable and so strange, and he is so utterly ignorant of the use it serves, that there was a concourse from all sides to see it, and all were filled with admiration. Their interest was as great as that of an astronomer when he discovers a new planet. That any man should have the hardihood to break off a piece of this singular object was no less matter of astonishment for the Kaffirs than the anchor itself. Well, the man died suddenly. What caused his death? They could find no natural cause: but there was the anchor, and this man had broken off a piece of it. Here were facts which spoke for themselves. So the anchor, the injury done to it, and the death of the Kaffir were without more ado ranged in the order of cause and effect, and the anchor was advanced in the estimation of the savages. The anchor had been injured and outraged and would have its revenge: here we have a specimen of anthropopathic apprehension of an inanimate thing. It slew the impious wretch: here we have an object that appears to be of some importance viewed as the cause of something else, viz.: the death of the transgressor. Henceforth that anchor is a dread and mighty Thing; so they greet it as they pass, to keep it in a good humor.

* Grimm, Deutsche Mythologie, I. Aufl. S. 306–7.

* Alberti, die Kaffern, S. 72; Lichtenstein, Reise, I. 412.

We find in this example four factors. First, the consideration of this strange object as something altogether peculiar, singular and important, simply *because* it is strange. Second, the anthropopathic apprehension of this object as something that lives, feels and wills.* Third, the establishment of the relation of cause and effect between this object and other things. Fourth, the apprehension of it as something mighty, which is therefore to be treated with reverence, to the end it may be friendly; or, in other words, as something which, in virtue of the inner nature attributed to it, becomes an object of veneration. We are now in a position to understand what is meant by a fetich. When an object is viewed in the fourfold manner above set forth, it is then a fetich, and fetiches are therefore objects in which these four factors are united.† The objects here are all sensible objects.

We have now empirically demonstrated that these are the necessary consequences of the savage's intellectual status, viz.: an over-estimate of inconsiderable objects, an anthropopathic apprehension of objects, an erroneous perception of causal relations, and the veneration of objects supposed to be causes. So the fetichistic mode of apprehending things flows quite naturally and inevitably from natural and empiric grounds. Granted only a contracted and undeveloped intelligence, and you have fetichism as the inevitable result. The mental status of the savage finds its natural expression in fetichism: fetichism is its System of the Universe, its philosophy, its religion; and hence fetichism, as being such System, Philosophy and Religion, finds its explanation when we have gained anything like correct notions of the savage intellect.

We will cite a few more examples to show how fetichism is made up of our four factors. "A negro of some distinction, an acquaintance of Römer's, was about to take refuge in a Danish fort, with his family and his valuables, to escape from the attack of a merciless enemy. On quitting his hut in the morning he stumbled on a stone with such violence that he suffered considerable pain. This accident caused him to regard the stone as a fetich. He at once picked it up, and never more parted with it, as through it he succeeded in escaping from the dangers which had threatened him."* "An American savage chose the crucifix and a little image of the Virgin that had come into his possession, for his Manitus. He never parted with them, after he had found, as he believed, that they protected him sundry times against the arrows of his enemy."† "As the Yakuts first saw a camel during an outbreak of the small-pox they pronounced that animal to be a hostile deity who had brought the disease among them.‡

The taboo of the South Sea Islanders is by many writers supposed to resemble the fetich, and even to be identical with it. Still the two things do not appear to be identical, if we accept the account which Gerland gives of the taboo. (Waitz's Anthropologie, Band. 5.) Waitz gives an excellent

* Bastian, S. Salvador, S. 227.

† The first writer to employ the word fetich was De Brosses in his work "Du culte des dieux Fétiches," which appeared in 1760 anonymously, and without the name of the place of publication. As to the origin of the word he says: ". . . certain deities, whom Europeans call Fetiches, a word formed by our traders in Senegal, out of the Portuguese term Fetisso, *i.e.* enchanted, divine, oracular. It is from the Latin root fatum, fanum, fari." Winterbottom, in his "Account of the Native Africans in the Neighborhood of Sierra Leone," derives the word from the Port. Faticeira, witch, or Faticaria, witchcraft. The Negroes borrowed not only this but also another word, gree-gree, from the Portuguese. According to Bastian (S. Salv. S. 95) the universal name in West-Africa for a fetich is Enquizi. Another name is Mokisso, or Juju (*Ibid.* 254, 81); also Wong (Waitz, II. 183); among several Amer. tribes, Manitu.

* L. F. Römer's Nachrichten von der Küste Guinea. Kopenhagen, 1769, S. 63, 64.

† Charlevoix, Journal historique d'un Voyage de l'Amérique septentrionale. Paris 1774, p. 387.

‡ Wuttke, Gesch. d. H. I. 72.

definition of the fetich: A fetich, says he, is an object of religious veneration, wherein the material thing and the spirit within it are regarded as one, the two being inseparable. As we have already said, the fetich is any object whatsoever, viewed anthropopathically, or regarded as endowed with human characteristics. Taboo, on the other hand, according to Gerland, is an object which receives religious veneration because it is the temporary abode of a spirit or of a Deity. "We know," says he, "the meaning of the taboo, the religious ban of Polynesia, and the question arises whether the same custom prevails also in Micronesia? It does; but though in the latter islands the belief in taboo is as universal as in Polynesia, still the taboo has not there so extensive a range of objects. (Gulick, Micronesia, in the *Nautical Magazine*, 1862, 417.)" The taboo attaches to meat and drink; and the notables of the Ladrones will not eat eels: the isolated inhabitants of Ponapi, the Marshall and the Gilbert Islands, etc., will not eat the flesh of this or that animal; the common people on those islands must not eat the kava, and on the island of Kusaie they must abstain from the cocoanut, etc.; several trees also are taboo, *i.e.* forbidden (Mertens, Recueil des Actes de la Séance, publ. de l'Acad. imp. Scientifique de St. Petersburg, 29 déc. 1829, 177); the rain-conjurers must not eat the blooms of the pandanus. Also places, temples and persons, *v.g.* great princes, are taboo for the commonalty. Whoever would go a fishing must be continent for the space of twenty-four hours. In conversing with women certain words were taboo: and thus we might go on rehearsing an interminable list of such prohibitions. The word taboo also is used in Micronesia (Kotzebue, Entdeckungsreise, II. 59; Hale, Ethnographie, in his Tarawa vocabulary, s. v. Tabu; Pickering, Memoir, s. v. Tabu, etc.), and in the isle of Morileu the word *pennant* is employed in the same sense. Thus a tree, or a locality, etc., would be *pennant* (Mertens, 134). Nor were the ceremonies employed in Micronesia to lift the taboo less imposing than those in use in Polynesia. Thus Cheyne describes a very protracted festival which he saw observed on the isle of Eap, the chief ceremony consisting of prayers addressed by the priests to the Sea-god, to induce him to quit a vessel that was taboo, and return to his native element. (Cheyne, "A Description of Islands," etc., 157 seq.) From this narrative we learn what is the meaning of Taboo. The god enters a thing and thus withdraws it from common use. The chieftains being of divine origin, their person and property are taboo to the commonalty, as is also whatever they are pleased to declare taboo.* This view of the taboo is very probably the correct one; yet we must not suppose that in Polynesia and in Micronesia the taboo is not also regarded in another light, and apprehended as a fetich. On the isle of Nukunono Fakaafo worship used to be paid to the Tui Tokelau, or Lord of Tokelau; and this was a stone wrapped up in matting and held so sacred that only the king durst view it, and even he only once a year, when it assumed a fresh suit of matting. (Turner, "Nineteen years in Polynesia," 527.) This stone idol, which was ten feet in height, stood in front of the temple, and was, at the time when Hale saw it, ten feet in circumference, owing to its thick wrappages of matting. (Hale, 158; Turner, 527). It was the Tui Tokelau that caused disease, so whoever was attacked would have a new mat wrapped about the god, to propitiate his wrath by means of this rather costly offering.† As this stone was considered so sacred, it was natural for the people to identify it with the deity. Whatever offerings they made to the stone, were made to the god: whatever petitions they had to address to the god, were addressed to the stone. Which is here the god,

* Waitz, Anthrop. Bd. V. Abtheil. 2; Gerland, S. 147.

† Waitz, Anthrop. V. Abth. 2, S. 195.

the stone or the deity? The better class of the islanders, those best instructed by the priests as to their religious belief, would perhaps regard the stone as only the habitation of the god, and consider the latter as distinct from the stone. But would the more ignorant sort make such a distinction? If not, the taboo was for them a fetich.

Here we have an observation to make. The so-called Religion of Nature, *i.e.*, the religion of the savage, has two aspects, which must be sharply defined and kept separate if we would have clear conceptions on the subject. Under one aspect sensible objects are worshiped; under the other, worship is paid to spirits. It is not asserted that either of these branches of Natural Religion arose prior to the other: they are both perfectly natural phenomena, springing inevitably out of an undeveloped state of intellect. The worship of sensible objects is founded on the relation subsisting betwen the mind and such objects: the worship of spirits is founded on the relation between the mind and the souls of the departed. These two systems run parallel to one another, and here and there unite their currents to form a single stream. This subject I propose to consider in another place. At present we have to do only with the worship of sensible objects, *i.e.*, with fetichism, and we purposely omit the consideration of the other branch of Natural Religion. We do not assert that the only religion of the Negro, for instance, is fetich-worship, though we study the Negro here only in so far as he is a fetichist. Just as in the higher grades of intelligence one individual will surpass another in mental development, so too will one savage excel another, and attain a higher grade of religious development, however contemptible his very highest grade may appear to be in our estimation. Thus the savage has already made one step in advance, as soon as he perceives that the object of his worship is not a being possessed of anthropopathic properties, that it cannot of itself perform those acts which he formerly attributed to it, or when he recognizes as *inhabiting* the object, a spirit separate from the material thing. Fetichism becomes thus elevated by means of the belief in spirits, and the fetich is advanced to the higher grade of the taboo. As the South Sea Islanders are raised above the very lowest stage of intelligence, the taboo is better adapted to them than the fetich. For the same reason, intelligent Negroes regard their fetich as taboo. Halleur gives the following as a specimen of Negro intelligence: "I wished to make a Negro understand the folly of offering to the fetich—a tree, for instance—food, drink, lemons, and palm-oil, as he himself must know that the tree made no use of them. 'Oh,' said the Negro, 'it is not the tree that is the fetich. The fetich is a spirit, and invisible, who lives in the tree. To be sure, he does not consume the material food, but he enjoys its spiritual portion, and rejects the material, which we see.'" * Here is the fetichist become a tabooist, supposing that the description of tabooism heretofore given is correct.

CHAPTER IV.

FETICHISM AS A RELIGION.

1. *The Belief in Fetiches.*

ACCIDENTAL coincidence determines whether or no an object shall be regarded as a fetich, as we have seen in the foregoing examples. The savage, however, cannot entertain a doubt as to the power of his fetich, for he has had evidence of this, and with his own eyes has seen how such and such an object brought about such and such an event: how the anchor slew the man, how the camel brought the smallpox. It is only after he has found

* Halleur, S. 39.

his fetich powerless in a considerable number of instances that he is undeceived. But it is a very difficult thing for him, owing to the obtuseness of his intellect, to suspect that the true cause may lie outside of his fetich. Even if his faith is shaken, it is impaired only so far as regards one special fetich, while it remains firm as to all others. He bases his judgment on the most superficial grounds. Thus, a plague broke out in Molembo soon after the death of a Portuguese; the two things were arranged in the order of cause and effect, and as long as the memory of the plague lasted the people of Molembo were very careful that no European should die within the limits of their country.* When cases occur, wherein the savage, according to his way of judging, directly sees the action of his fetich, his belief is confirmed. "In a clearing in the woods," writes Bastian, "I observed on the side of the road a fetich-house, and wished to examine it more closely, but my black carriers could not be induced to carry me to the spot. As I alighted, to go on foot, they almost resorted to violence to withhold me from executing my purpose, and I read in their eyes, when I came back to them, that they regarded me as certain to die very soon. . . . Weary, I reached Quimolenzo toward night, when suddenly my sight failed me, and I felt myself sinking powerless to the ground. A violent fever raged in all my veins, and this continued through the entire night. The following day it was the same, and I was so weak I could not rise from the bed. My people exchanged knowing looks, as much as to say: The spell of the fetich is working; and they were quite sure they would have to bury me before night." † "In front of the American's house (in Shemba-Shemba, West Africa) there was a crowd of people assembled, in the midst of whom a fetich-priest was running up and down with loud cries, jerking hither and thither a wooden puppet decked with tatters of every color, and beating it with a switch on the face and shoulders. I learned that a knife had been stolen from one of the Negroes, and he had applied for its recovery to this priest, who was the owner of a fetich in high repute as a detective of thieves. The unfortunate god appeared to me to have paid dearly for his reputation, seeing that he got a merciless whipping to begin with, to teach him the necessity of attending seriously to his business. The priest having wrought himself up to a high state of prophetic clairvoyance, announced to the spectators, in a tone of perfect assurance, that the next morning they would find the knife alongside the fetich, which he posted in front of the factory. In the morning there lay the knife, for the merchant, disliking a continuance of these ceremonies for an entire week, chose rather to confirm the infallibility of the fetich, than to expose his property to the risk of being plundered, if the people continued to flock around his establishment." *

The savage has never a doubt as to the efficiency of his fetich, and his faith is all the stronger because ever since he was a child he has seen every one entertaining the same belief, and so his mental fiber is, so to speak, saturated with it. Every one knows the force of early impressions; how the great mass of mankind never emancipate themselves from their influence, and how it is only after many a painful inward conflict that a man escapes from their dominion. But this absolute faith of the savage in the power of his fetich, disposes him to view it with dread; this dread in turn serves to exaggerate the apparent efficiency of the fetich and so to confirm more and more the man's belief in its power. "When a Negro has anything stolen from him he entreats some great fetich to discover the thief. The pomp of ceremony attending the consultation of the fetich oftentimes

* Bastian, S. Salv. S. 104.
† *Ibid.* S. 50, 53.

* Bastian, S. 61.

so fills the thief with consternation that he surrenders the property." * The thief being also convinced that the fetich has power to hurt him, gives back what he has stolen, or confesses the theft. "The rich frequently employ a Kassa potion to make their domestics confess their thefts." † In Great Bassam they merely lay a fetich-stick upon the body of the accused. If he is guilty, he is sure to confess; his fears will extort the admission.‡ Beneath the threshold of the king of Dahomey's palace is set a charm which causes his wives internal pains whenever they are guilty of misconduct, and so they often find themselves constrained to make a voluntary confession of their guilt.§ To this category of beliefs belongs the so-called *Judgment by the Lizard*, which is in vogue among the inhabitants of Senegal. A smith beats upon a lizard with his hammer; the fear of incurring the evil fortune which is supposed to follow from this performance is expected to bring the thief to a confession, and it usually does.‖ Many similar delusions are recorded in books of travel. But especially noteworthy is the Obeah of the West India Islands, particularly Jamaica, a baneful superstition for the eradication of which the most stringent enactments of law have proved insufficient. Its influence upon the minds of the Negroes is so great that at one period it notably increased mortality among them; at another, stirred them up to mutiny, by impressing them with a belief that they were invulnerable.¶

Thus fetiches serve for ordeals, which among the Negroes usually consist of poisonous potions, or of emetics and drastic agents.* The fetich has power to punish the guilty: the innocent he will not hurt. As the fetich must come into bodily contact with the subject of the ordeal, the latter is required to drink fetich-water,† or water in which the bark of the wild manioc, or some other substance has been steeped. According to Halleur, "fetich-water is prepared from the bark of the tree odum. It is supposed that, as this tree is always a fetich, when a person accused of crime drinks the water in which its bark has been steeped, the fetich enters into him and thus discovers either his guilt or his innocence. If the accused party vomits, it is a sign that the fetich has discovered his innocence, and is quitting his body: but if the fetich-water is retained, then the fetich has discovered his guilt, and will not quit him until he has been punished." ‡ "The accused may, under certain conditions, send a slave to take the questionable potion in his stead. Many, however, of their own accord apply to have the fetich-water administered to them, to be purified by the ordeal." § Very often the accused has the magical potion given to him without his knowledge, so that the savage lives in constant fear lest any one should employ this redoubtable form of fetich against him. The power of this spell may be estimated from the fact that the trading-post of Bimbia, between the Calabar and the Cameroons, and opposite to Fernando Po, which was at one time a missionary station, has become almost entirely depopulated, owing to the employment of the fetich-water during many years by the notables of the place on every slight occasion. ‖ Nor is the ordeal by fire or that by water unknown in Africa. In Mada-

* Proyart's Geschichte von Loango, Kakongo u. s. w. Aus dem Französischen. Leipzig, 1777, I. 167.

† Bastian, S. Salv. 61.

‡ Hecquard, Reise an die Küste und in das Innere von Westafrika. Leipzig, 1854, S. 48.

§ Forbes, Dahomey and the Dahomans. Paris, 1851, p. 55.

‖ Boillat, Esquisses sénégaliques. Paris, 1853, p. 102.

¶ Bryan Edwards, Hist. des Colon. Anglaises, p. 266; Waitz, II. 190.

* Winterbottom, p. 172; Köler, Einige Notizen über Bonny. Göttingen, 1848, S. 127 seqq.; Cavazzi, Histor. Beschr. der Königreiche Congo, etc., 1694, 94, 108 seqq.; Proyart, S. 141.

† Bastian, San Salvador, S. 84, 306. *Cf.* S. 203.

‡ Halleur, S. 34.

§ Bastian, S. Salvador, S. 85.

‖ *Ibid.* S. 306.

gascar the accused person has to undergo the ordeal of red-hot iron.* Among the Malay Lapongs the glowing iron is applied to the tongue of the accused,† while among the Antaymours the ordeal requires him to swim across a stream inhabited by caymans.

If a fetich which first owed its distinction to accident, displays its power again on another occasion, it may easily transcend the rank of being one man's fetich and be adopted by an entire family, or even by a larger aggregation. For in America, Africa, and Siberia,‡ each individual has his separate fetich; each family, and even each tribe, their respective fetiches. The fetich of a tribe is honored with more pious and constant devotion than the inferior fetiches, as having for a longer period shown his efficiency.§ Thus there are Grand Fetiches, which are regarded with profound awe, and which, in the shape of mountains, trees, rocks, etc., protect the chiefs or the territory of the tribe.‖ The fate of mankind is by the American Indian thought to depend upon the belt of wampum. The chief of the Muemba is Chiti Muculo, "the Great Stick, the Great Tree," The center of religious and political life among the Wanikas is the Muansa, in whose honor the tribe celebrate roaring festivals, and which is to be approached only by the chief. This holy of holies is a wooden instrument which emits a peculiar buzzing sound.* The Grand Fetiches have their mysterious influence intensified, by being, as far as possible, withheld from the gaze of the profane. "The Grand Fetich," says Bastian, speaking of one in Congo, "dwells in the midst of the bush, where no man sees him, or can see him. When he dies, the fetich-priests carefully collect his bones, in order to reanimate them; and supply them with nourishment, so that the Fetich may anew gain flesh and blood." †

Nor do the Negroes regard the Christian religion as anything but the worship of a Grand Fetich. Thus San Salvador (called by the natives Congo dia Gunga—the tones of the bells—on account of the great number of its churches and convents) was widely known and feared throughout South Africa, as the home of a powerful fetich.‡ The negro is so rooted in this mode of apprehending things, that he is ever returning to it, or rather, he never quite gives it up. "It has ever been the study of the missionaries to check the abominable practices of fetichism, and with the aid of the civil power they have succeeded in abolishing the worst features of this Moloch worship, though not in substituting any other religion in its place, and the Negroes have advanced only so far toward conversion as to use salt." § The only reason however that induced them to go even thus far was, that they thought salt would cause their children to grow fat. But they soon refused salt again, first because the ceremony cost too dearly, and secondly, because, as they

* Leguével de Lacombe, Voy. à Madagascar (1823–30). Paris, 1840, I. 233.

† Waitz, Anthrop. V. Abth. I. S. 149. *Cf.* II. 523.

‡ Charlevoix, p. 344, 346. Lettres édif. Nouv. Ed. VI. 174. De Bry, Descriptio auriferi Regni Guineæ in Part VI. of India Orientalis, VI. 21. Oldendorp, Geschichte der Mission der evangelischen Brüder auf den caraibischen Inseln St. Thomas, St. Croix, und St. Jean, herausgegeben von J. J. Bassonet. Barby, 1777, I. 320 ff. Des Marchais, Voyage en Guinée, Isles voisines et à Cayenne en 1725–27 par le P. Labat. Amsterdam, 1731, II. 131, 152. Georgi, Beschreibung, S. 384.

§ J. B. Müller, Mœurs et Usages des Ostiakes, in the Recueil des Voyages au Nord. Amst. 1731, Tom. viii, 413, 414: "Les Ostiakes ont beaucoup plus de vénération pour leurs idoles publiques, qu'ils ne dépouillent pas et n'abandonnent pas comme les autres; mais ils les estiment au contraire, et les revèrent comme etant d'ancienne date et d'une autorité reçue et avérée.

‖ De Bry, vi. 21. Des Marchais, I. 297: "Les rois et les païs en ont d'autres qu'ils appellent les grands Fétiches, qui conservent le prince ou le païs: telle est quelquefois une grande montagne, un gros rocher, un grand arbree," etc.

* Waitz, Anthrop. III. 190; II. 422, 424.

† Bastian, S. Salv. S. 82.

‡ Bastian, S. Salv. S. 173.

§ *Ibid.* S. 96.

said, the elephant grows fat though he uses no salt. "In Congo, where the ruins of churches have served to perpetuate the memory of the Christian religion, the natives account for their ignorance of Christianity by saying that the Desu of the Portuguese is too mighty a fetich for common folk, and so was reserved for the king alone, while his subjects had more comfort in worshiping fetiches of the time of Chitome, Guardian of the Sacred Fire.* A Christian priest is for them only a fetich priest practicing peculiar fetich ceremonies. "When the slaves, torn from family and friends, were put on shipboard in chains, to drag out a miserable existence over sea beneath a foreign sky, and in foreign lands, the pious bishop of Loanda sat on the stone seat at the end of the wharf and assured them, with his apostolical benediction, of a future replete with joys unutterable, with which the brief period of their probation here below durst not be compared. The poor Negroes understood nothing of the ceremony but this, that the white man's fetich now deprived them of their last hope of ever again seeing their native place. Their names however were registered in the account presented to the Pope by the society de propaganda fide, to be by him duly authenticated and submitted to St. Peter."†

As all the savage's thoughts and the whole conduct of his life are governed by fetichism, he regards his fetiches as absolutely necessary to his existence. Any rude shock given to this system of ideas and usage, causes emotions in the mind of the savage, as painful as those aroused in men of other beliefs by the act of sacrilege, and the hatred of the blacks for the whites is largely owing to the disregard of this fact on the part of the latter, and to the daily and hourly insults which they thus offer to the black man's religion. Bastian wished to take a bath in a river near a certain Negro village. As he was on his way he was met by the Mafooka, the oldest man in the place, accompanied by the entire population. "On inquiring what he wanted, I found that he desired me not to go any nearer to the water; and he promised that my name should live for all time in the songs of that valley, if I would yield to his most humble entreaty. I scarce thought it worth while to pay any attention to the absurd request, which I judged to have been made simply with a view to deprive me of a pleasure I had long coveted, so I told the gabbing old man to betake him to a warmer region than his own country, and ordered my carriers to go on. This however it was impossible for them to do, for screaming children in swarms grasped them by the legs, and threw themselves upon the ground before them, to block up the way. In heart-rending tones of wailing the Mafooka, in the mean while, struck up a song of woe, the effect of which was increased to the most painful degree by the chorus, in which all joined. The expression of blank despair was visible on every countenance. Poor people! Small wonder it was so: for the next day, on further inquiry, I learned that had I looked upon the stream, its sources would have been dried up forever, and their only supply of water cut off! Rather than bring upon my soul the guilt of so great a catastrophe, I preferred to return unrefreshed. As we came near another village, my carriers halted, and the interpreter said my coming must be announced beforehand. I therefore dispatched him to make the announcement. On his return he informed me that the usages of that country did not permit any one to pass through the village in a hanging-mat. To avoid delay, I submitted to the regulation: but when he insisted on my going through the same formalities at the next village I ordered the bearers to move on. They hesitated, and only resumed the journey after repeated commands. Scarce had we reached the first hut, when with wild cries the entire popu-

* Bast. S. 96.
† *Ibid.* S. 98.

lation, armed with spears, sticks and muskets, surrounded my mat-palanquin and began to belabor the carriers. In the mean time I had distributed among my coolies the guns I had with me for presents, and, alighting at the moment of the attack, we soon had an unobstructed passage. I passed through the villages thereafter without difficulty, and so I saved much time which else had been wasted in the observance of ancient customs. Wherever I observed that this disregard for ceremony gave very deep offense, I distributed a few gifts among the seniors to appease them."*

Thus the savage is the abject slave of customs which to us appear ridiculous; and so little doubt has the Negro as to the truth of his fetichistic religion, that many of them ascribe the contempt of Europeans for the fetiches to the natural stupidity of the white man.† Every Negro, even the sternest autocrats and despots, bow in reverence before the fetich. "Every year the Duke and Duchess of Sundi were required to wage a symbolic contest with the chief fetich priest, by the sacred tree in Gimbo Amburi; they were always worsted, and obliged to acknowledge the fetich's power." ‡ Even if the Negroes do now and then admit the absurdity of their faith and worship, still they cling to them because tradition vouches for them and they themselves know of nothing better.§

2. *The Range of Fetich Influence.*

The efficiency of the fetich is, for the savage, beyond all question, and there is no limit assignable for its influence. I do not mean to say that each individual fetich possesses this unlimited power, but that there is nothing which is not subject to one fetich or another. The question for the savage is what kind of objects may be employed as fetiches to meet various contingencies. Not to speak of the daily discovery of fetich power in new objects, there are sundry things which have long been known as *fetich* for certain defined purposes, and which, as such, are received by all. Now a fetich may be either friendly or hostile toward me. First, he shows himself friendly toward me when he confers a benefit, or when he preserves me from evil. The Cabinda Negroes always carry their little idols (Manipancha) about with them; commune with them in a state of high nervous excitement; counsel with them as to the future; obtain from them news about home and family, and have firm faith in the revelations which they suppose they receive from their fetiches.* Some American Indians carry similar figures, carefully wrapped up, in their medicine-bags. On solemn occasions they are taken out and treated with great reverence.† In short, no action of any moment is commenced, whether the chase, or fishing, or war, without first consulting the fetiches as to its ultimate success and as to the best mode of commencing it.‡ As in the ordeal, the fetich here appears as a Being that knows hidden things: in the ordeal, things past, here things to come. This is the original of the Oracles. On the Gold Coast the most renowned Oracle is at Mankassim.§ But the fetiches confer other benefits, besides revealing the past and the future. They bring "luck;" and for this purpose they are carried on fishing and hunting expeditions and when the tribe goes to war. There are fetiches for river fish and for sea fish; for favoring winds; for a cheap market; for health; for clear sight, etc.‖

* Bastian, 60, 108.
† Livingstone, Missionary Travs. (Germ. Trans.). Leipzig, 1858, II. 83.
‡ Bastian, 204.
§ Bosmann, III. 281.

* Bastian, S. 81; Tams, Die portug. Besitzungen in S. W. Afrika. Hamb. 1845, S. 89.
† Schoolcraft, Information, etc., V. 169.
‡ *Cf.* Meiners, Allg. Krit. Gesch. d. R. Bd. 1, S. 176.
§ Cruickshank, Eighteen years on Gold Coast (1834), p. 227.
‖ Bastian, S. Salv. S. 80; Des Marchais, II. 130 seqq., 152 seqq.; Bosmann, 179 ff.

"The usual form of a fetich specially intended for those on a journey is a ball of red cloth, within which the fetich priest encloses some powerful medicine, generally the extract of some plant (milongo). Further, the Negro suspends all about his person cords with most complicated knots, roots, bullets, and in a word any object that strikes his fancy. The Bushman who acted as my guide in Shemba-Shemba had an image three feet long dangling from his belt, which he never would think of removing. In fact, the heavier the load with which you burden a Negro, the greater the number of fetiches he in turn will add, to make things even."* The ordinary fetich is generally a very unpretentious object—often a couple of leaves from a tree.† "The poorer Negroes of the interior are often quite content if they only have a cord to tie around the calf of the leg. Frequently this cord is of matebbe, which, like plumes in the hair, gives invulnerability. The Kroo Negroes almost universally wear this cord around the shank, but more loosely than the Caraibs. The Catholic missionaries were for a while much elated with the thought that they had rooted out this particular form of fetichism, by substituting for the common cord one twisted out of palm-leaves blessed on Palm Sunday."‡ Among the Kaffirs the warriors are rendered invulnerable by means of a black cross on their foreheads and black stripes on the cheeks, both painted by the Inyanga, or fetich-priest. This contrivance makes the warrior invisible, while it deprives the enemy of his sight and fills him with terror.§ The Negro's faith in his fetich which renders him invulnerable and disables his enemy's arm is so strong, that he will court danger, suffer arrows to be shot at him, and allow his arms and legs to be hewn off.*

But yet some discretion is to be used in the choice of the material which constitutes the fetich, and the savage will very naturally suffer his choice to be determined by the value of the object he selects. The natives of Siberia prefer metallic fetiches to all others, these being, as they suppose, by reason of their great age, possessed of a longer experience and a higher wisdom than are possessed by other materials less durable by nature.†

In warding off evil the fetich does but exhibit the other side of his beneficent disposition. There are fetiches against thunder; to extract thorns that have penetrated into the feet; against wild beasts; to save one from missing his path, etc.‡ By being employed against disease, the fetich becomes medicinal, and thus also the fetich-priest is at the same time necessarily a medicine-man, or physician.§ "When on Fernando Po contagious diseases break out among the children the skin of a snake is fastened to a pole in the middle of the market-place, and thither mothers bring their infants, to touch this fetich. In the village of Issapoo the renewal of this snake-skin in the Reossa (market-place) is the occasion of an annual festival, and it is first touched by the infants born during the preceding year." ‖ The savage, being ignorant of the real cause of disease, attributes it directly to the action of a hostile fetich, and always judges death to

Proyart, I. 167; Oldendorp, I. 324; Georgi, S. 384; Voy. au Nord. VIII. 410–414; Charlevoix, p. 340, 348; Lettres édifiantes, Nouv. Ed. VI. 174 seqq.

* Bastian, S. 80.

† Halleur, 19. *Cf.* Waitz, II. S. 186.

‡ Bastian, S. 79.

§ Döhne, Zulu-Kafir Dictionary. Cape T. 1857, p. 303.

* Proyart, p. 192; Bowdich, p. 364 seqq.; Köler, S. 127.

† Voyages au Nord. VIII. 414. "Ils ont beaucoup de confiance en elles, surtout quand elles sont d'airain, cela leur donnant, à ce qu'ils imaginent, une sorte d'immortalité, parce qu'elles ont resisté à la corruption du temps immémorial, et qu'elles ont acquis, pendant tant d'années, beaucoup de lumières et d'expérience.

‡ Bastian, 80.

§ *Ibid.* 81, 138.

‖ Bastian, 318, 319.

be brought about by witchcraft.* Against such a power naught can avail, save counter charms, to be obtained by the priest or magician from their more potent fetiches. It is true, the Mandigoes employ many wholesome medicinal agents—herbs, potions, infusions—but yet they generally make only external applications of them.† As a lock of hair, or a few drops of blood, may be so enchanted as to throw a spell upon the person from whom they were taken, the Kaffirs, in order to avoid the suspicion of such practices, are always very careful to restore such articles—vermin included—to the owner, so that he may secretly bury them out of sight, or destroy them. ‡ "In case of sickness they call in a male or female conjurer; and of these there is one specially qualified to deal with each special class of diseases. The conjurer undertakes to blow counter to the evil wind sent from a distance by some enemy: if, however, he is unsuccessful in this, nor yet can prevail with the aid of music, then he gives up his patient to the wicked dæmon." § "When a Negro falls sick," says Halleur, who describes the scene more particularly, "his relatives apply to the fetich-priest. After he has got their offering of rum and cowries (for without these gifts the holy man is quite inaccessible) he inquires of his fetich, who it is that has bewitched the sick man: for they believe that disease is caused only by witchcraft. The priest next fashions out of clay an image of the conjurer named by the fetich and carries it into the forest." This same course is followed by the medicine-men among the American Indians. They stab the image with knives, or shoot arrows into it, whereby the witchcraft is turned against the conjurer himself. It frequently happens that he who is the bewitched actually regards himself as held by a spell, and soon dies of profound melancholy.* "But," continues Halleur, "if the spell is obstinate, and refuses to give way, then the rum-offering and the ceremonies of disenchantment must be repeated, and the patient treated with remedies prescribed by the fetich, and prepared by the priest. This treatment is followed up till the sick man either recovers, or succumbs to the power of the over-strong spell. The corpse is borne about the entire village previous to its interment in its former home. Oftentimes the bearers, when passing the house of one they dislike, or on meeting such a one on the street, halt suddenly, pretending that the corpse refuses to go any further. The priest asks of the dead man the reason of this unwillingness to proceed, and gets for answer that the occupant of the house or the passenger in question is the conjurer that bewitched him. The man is at once arrested and held to prove his innocence, after the funeral is over. This proof is made by the administration of the fetich-water. The punishment is death, in case the suspected murderer cannot prove his innocence, or if, when proved guilty, he cannot purchase life for a considerable sum." † "When the draught of fetich water proves fatal to the party accused, the priests search for the seat of the enchantment in the dead body, and exhibit to the people portions of the viscera forcibly torn from their place and now unrecognizable, as *corpora delicti*, just as the medicine-men pretend to extract a splinter or a stone.‡

Among the Bambarras, if one of the highest caste of the Kubaris fall

* *Ibid.* 91; Halleur, S. 32; Waitz, II. 188, 503.

† Park, Voyage dans l'interieur de l'Afrique. Paris, an VIII. II. 27 seqq.; Cord.-Laing, Voyage dans le Timani, le Kouranko et le Soulimana (1822). Paris, 1826, p. 350.

‡ Steedman, Wandering and Adventures in the Interior of Africa. London, 1835, I. 266.

§ Bastian, 87.

* De la Potherie, Hist. de l'Amér. septentr. Paris, 1722, II. 39; Keating, Narr. of an Exped. to the Source of St. Peter's Riv. London, 1825, II. 159.

† Halleur, S. 32 ff.; Vignon in N. Ann. des Voy. 1856, IV. 299; Waitz, II. 189.

‡ Bastian, 85.

sick, the presumptive cause of his disorder is, that someone has, whether purposely or unawares, touched one of his wives. The offender, who must be discovered, and who is discovered by the great oracle of the Buri, is either banished or put to death.* It may, however, appear to the priest that the disease was due to the patient's own transgression, in having forsworn, or omitted the customary offerings.†

The fetich has power to heal bodily diseases; a draught of fetich-water can discover in the heart the proofs whether of guilt or of innocence; and it is therefore but natural that it should have also power to banish moral ills. During the festival of the First Fruits the men of the Creek tribe of American Indians used to take, after a prolonged fast, the war-medicine, being strong emetics and drastic agents,‡ while the women bathed and washed themselves. All offenses, with the exception of murder, were thus blotted out.§ It is beyond question that the idea of purification from sin attached to these ceremonies, but especially to the bath and the drinking of the "black draught" as it was called, an infusion of dried cassine-leaves. The taking of this draught was accompanied with peculiar rites; and it was intended also to "give courage and cement friendship." The Cherokees used a similar potion, "to wash their sins away," as they said.‖ "Though the superficial observer might here suspect a reminiscence of Christian doctrine, still if we look at the matter more nearly it will scarcely appear probable that so important and mystic a rite should have had such an origin, especially as we seek in vain among these tribes for any evidence of their having been ever in contact with the Christian religion."*

The savage attributes to fetich influence not alone disease and death, but every phenomenon he is unable to account for, as, for instance, storms and the changes of weather. He is thus furnished with an explanation for everything; and this explanation is entirely satisfactory to him. It is plain that this fact of the savage having ever ready at hand such unquestioned "ultimate reasons" to account for everything must check the development of his mind, or, in other words, must retard his progress toward civilization. For he knows *à priori* the cause of phenomena, and the means by which they are produced: hence it never occurs to him to study their natural causes and conditions: consequently he does not recognize the natural relations between things, and fails to discover that the supposed cause is no cause at all. His mind accordingly makes no advance, but is ever under the tyranny of hallucination. And every *à priori* principle has the like tendency to check the mind's development; for here it is all one whether it is the Negro that says: this is the work of the fetich; or whether it is the Mohammedan that says: this is Allah's work. A formula explains everything for them both, and by its very explanation leaves everything unexplained.

Fetiches also ward off evil spirits. When the women in Shemba-Shemba have occasion to quit their fields for a time, they strew them with fragments of pottery, for else the malign spirits would trample down the crop.† The Negroes of Whida post fetich images, five or six inches in height, at either end of their fields, at the doors of their houses, in their apartments, court-yards and cattle-stalls, being fully convinced that else evil-minded spirits or men would do them

* Raffenel, Voy. dans l'Afrique occid. (1843–4). Paris, 1846, I. 318.

† Bosmann, II. 184.

‡ Schoolcraft, Information resp. the History, Condition and Prospects of the Indian Tribes. Phila. 1851, V. 685.

§ Adair, Hist. Amer. Indians. Lond. 1775, p. 105, 120; Schoolcr. V. 266 seq.

‖ Memoirs of Timberlake. Lond. 1765, p. 78.

* Waitz, Anthr. III. 209. Similar rites among the Kaffirs, II. 414.

† Bastian, S. 62.

injury.* The same custom is followed by the Polynesians of New Zealand, Hawaii, Nukahiva and other islands.† Burying-places, too, are protected by potsherds and little images.‡ A low, thin hedge encircles Negro villages, at a distance of about 100 paces from the huts, and this serves to keep aloof evil spirits.§ A line of twisted bast forms a cordon of defense round about a Boobie village in Fernando Po.‖ Here also the natives employ mussel shells as fetiches. When the devil would come to do them harm, his feet are lacerated by the angular points of the shells.‖ Seeing that spirits have such fear of the fetiches with what dread thieves must regard them! "Over the doorway of the Negro hut are suspended roots and cast-off rags, and often broken egg-shells, as guardian fetiches. Others employ a block of wood with the likeness of a human face cut in it, and this they plant within the doorway of the hut, or in their fields; yet most of them are contented with a rather smoothly-dressed pole, on which they set a snail's shell, as a most potent fetich." "In a village near S. Salvador I saw wooden fetiches with lofty plumes, set up as guardians in front of the houses; in front of the main entrance to another village I saw an empty pot supported on a forked stick." "They have no locks to their doors, nor do they need them, for but rarely is there found a thief so foolhardy as to pass the fetich posted near the threshold."¶ "The Negro avoids touching them, lest a curse should come upon him."* The following will show how dangerous a thing it is merely to touch a fetich. Captain Rytschkow, having entered a hut in a certain Wotiak village, observed lying on a board that was fastened to the wall something which he took to be dried grass. He approached to examine it, but scarcely had he taken it in hand when the owner of the hut and his wife, with loud cries of distress, ran to where he stood and begged him piteously not to touch their Modor, or household god. They explained to him how the most grievous misfortune would befall them if even one of the family, to say nothing of a stranger, were to touch the Modor. This Modor consisted of some sprigs of fir, which a certain aged Wotiak had alone the right to touch and to distribute among the several families.† But the guardian power of fetiches goes farther still: to them indeed the appeal is made, *Videant ne respublica detrimentum capiat.* They are the Protectors of the country ‡ and of its laws. "To give due sanction to a law, it is placed under the special protection of a fetich, whose duty it then is to punish violators of it, as also the one who, knowing of a violation, does not lodge a complaint against the offender." Furthermore, "when a priest administers an oath, he gives to both parties a draught of the *bitter water*, and this, laden as it is with the fetich's malediction, will slay the one who proves false."§ The Orang-Benuas in Malacca have similar usages, and indeed they prevail throughout the entire Malay race, being practiced especially when they form alliances. They drink some liquid mixed with blood, in which a dagger or the points

* Des Marchais, II. p. 153. Ce sont pour l'ordinaire des petits marmousets de terre rouge ou noire de cinq ou six pouces de hauteur; ils les mettent à la tête et à la queue de leurs champs, aux portes de leurs maisons, dans leurs chambres, dans leurs cours, dans leurs parcs à cochons, dans leurs pouliers; . . . ce sont pour eux des gardiens, des sauve-gardes à qui ils se croyent redevables du bien qu'ils ont, et d'être à couvert des malheurs qu'ils craignent. *Cf.* also Römer, Guinea, S. 38.

† Gerland, *ap.* Waitz, Anthr. V. 2, 225.

‡ Bastian, S. Salvador, S. 107, 124.

§ Halleur, S. 23.

‖ Bastian, S. 316, 348.

¶ *Cf.* Waitz, II. 422, 502.

* Waitz, 79, 186, 316, 78, 348. The same is related of the Loando Negroes by Proyart, I. 168, 169.

† Rytschkow, Tagebuch über seine Reise durch verschiedene Provinzen d. Russ. Reiches in. den Jahren, 1769–71, S. 166, 167.

‡ Des Marchais, I. 297.

§ Bastian, 293, 90; Waitz, II. 157; Meiners, B. I. 176.

of arrows have been dipped; these will kill the perjurer.* The Burats pay special worship to a lofty rock on the shore of Lake Baikal. They who take an oath must ascend this rock, and on its summit perform the usual rites. It is the firm belief of the natives that whosoever profanes by perjury the sacred mount can never come down again, and that the mountain slays him.†

Among the Africans, too, as among the Malays, alliances are consecrated and confirmed by being placed under the protection of a fetich. "At the conclusion of the meal, each Macota comes and kneels before the Yaga, who puts into the mouth of each a piece of human flesh reserved from the banquet, so that by partaking in common of the viand they may be all bound together by an indissoluble fetich. In Great Bassam, after the feticeros have ascertained the portents betokened by the entrails, the heart and liver of the victim sacrificed at the forming of a new village, together with the flesh of a hen, a she-goat and a fish are baked all together in a pot, and the entire community is required to eat of the mess, under penalty of dying within the year.‡

The fetich, by punishing perjurers, maintains the stability of oaths and of alliances. The fidelity of the savage depends upon his fear of the fetich: and were he to lose this fear, he would be free from every obligation. When therefore he would renounce these obligations, he must deprive the fetich of all power to do him injury, and break its ban if that can be done; or in case this is impossible, he must only disregard the obligations, and then depend upon gifts and sacrifice to appease the wrath of the offended deity. And either one or other of these two courses the savage in reality adopts. The spell of a mighty fetich may be broken by that of one mightier still; and an offended fetich may be appeased by gifts.* The priest undertakes to make the offering acceptable to the fetich, or to render him harmless. According to Cavazzi, the Ganga Nzi gave release from a sworn obligation, by erasing it, as it were, from the tongue, with the fruit of the palm-tree. Often, too, a fetich may be deprived of the power to hurt, by being imprisoned.†

The power of the fetich is great; great also is the fear which he inspires. Now, just as my fetich can do injury to other men, so may their fetiches injure me. The consequence is that I must be in a state of constant anxiety, and ever on my guard, for how can I say but that some one is possessed of a fetich hostile to me, which he may employ against me? "The savage anxiously scans a stranger, as the latter may perchance be the owner of a formidable fetich. He will be inclined to run away; or, in case he thinks himself strong enough, he will try to make away with the newcomer."‡ In this point of view the following occurrence is characteristic. One of Bastian's suite was attacked and robbed. "I sent a force to the Elder of the nearest village; and on his refusing to come of his own accord, they compelled him to come to me. As the attack took place within his jurisdiction, I held him accountable, and required him either to discover the robbers or himself to make reparation for the outrage. He protested his ignorance of the affair and his inability to comply with my demand. As I could not delay, I took out my note-book, to make a memorandum of the name of the place. So soon as I set pencil to paper he fell into a violent convulsive tremor, and prostrate at my feet, entreated me not to undo him with my fetich-

* Newbold, Account of the British Settlements in the Straits of Malacca. Lond. 1839, II. 395.

† Isbrand, Voy. au N. Tom. VIII.; Pallas, Mongol. Völker, I. 218.

‡ Bastian, S. 154.

* Bosmann, II. 54; Monrad, Gemälde v. d. Küste von Guinea (1805–9). Weimar, 1824, 37, *note*.

† Waitz, Anthr. II. 185.

‡ Bastian, S. 104.

book, for that he was ready to perform whatever I should require."*

Accordingly there are many tribes which have gained for themselves a certain degree of impunity through the terror inspired by their fetiches.†

"The ointment *magya sambo*, invented by Tumba Demba II., daughter of Donghi, and which was prepared from the body of an infant brayed in a mortar, made her warriors invulnerable, and so wrought on the fears of her enemies as to make them powerless."‡

The fortunate possessor of such a "Grand Fetich," which domineers over the fate and fortunes of others, will prize this more than all his other property. A woman held a fetich of this kind, owned by her, dearer than all her children, and refused the offer of five slaves, which was made to her for it.§

The hostile fetich may be concealed anywhere, and may be carried anywhere by an enemy; so that a man is never secure from danger. If the Negroes would take vengeance of any one, they get a feticero to bewitch a piece of meat or other food; and this they set in some place likely to be visited by their adversary, who will thus infallibly come by his death.‖ Accordingly the Negro, ever in dread of witchcraft, at every turn pronounces a counteracting charm. "The host must always first taste of a dish before it is passed to his guests, so as to 'extract the fetich,' and this custom is universal throughout Africa."¶ There are also other fetiches to meet this danger. "To guard against fetich-water, the more wealthy provide themselves with cups made of rhinoceros horn, which pass here, as also in India, for sure reagents against poison. In Bimbia the natives protect themselves against poison-water by burying in some remote valley of the interior a twig with which they mystically connect the duration of their lives, hoping thus to have placed the latter beyond the power of any fetichman."* Nor are fetiches themselves secure against one another, and so quite naturally you will see a fetich with a number of other fetiches attached to him, for protection.†

3. *The Religiosity of Fetich Worshipers.*

The fetich being possessed of such powers, the bestower of so many benefits, the defense against so many ills, it will be the duty of the savage without delay to choose a fetich for his guardian. Accordingly the life of the new-born babe is immediately placed under such tutelage, and the fetich thus chosen as guardian of the infant watches over him through life. But the fetich will not care for his ward except on condition that he receives service in return. He requires of his charge submission, obedience; he exacts a vow,‡ and imposes a command, which his protégé is expected to perform with all fidelity. So long as he is faithfully served, the fetich preserves his ward from danger and misfortune; while, on the other hand, disobedience brings down his wrath, and is surely punished: "In sundry parts of Africa the babe is tattooed on the abdomen immediately after its birth, as a sign of its consecration to some fetich."§ "Within a few days after it is born the child is brought to the Ganga (fetich priest), who imposes on it one or more vows; and the mother takes care to accustom her child, from its earliest years, to the performance of those vows, and gives it such instruction as to their obligation as will make it easier in after life to

* *Ib.* 225.
† *Ib.* 129.
‡ *Ib.* 234.
§ Cruikshank, 241 seqq.
‖ Bosmann, Guinea, S. 179.
¶ Bastian, 135.

* *Ibid.* 85, 306.
† Oldendorp, I. 324 ff.
‡ For the Amer. Indians, v. Charlevoix, 349; for the Negr., Moore, Travels into the Inland Parts of Africa, 91; for the Siberians, Georgi's Reise, 599 seqq.
§ Bastian, 77.

discharge them. In some tribes, however, this mystic union with the Mokisso is delayed until the critical period of youth, that of puberty, when, in Africa, the boy-colonies, who then begin to be visited by the ideal dreams of youth, retire into the woods, and when the Indian lad climbs his solitary tree. Important occurrences in one's life are also occasions for acknowledging the power of the fetich." *

Among the American Indians a youth's "life-dream" is of high importance for his successful transition from boyhood to manhood. During this dream he receives a special guardian spirit, his "medicine," which he ever after carries about with him, in the shape of some animal's skin. The youth of 14 or 15 years retires into solitude and there abstains from all food for a time, so that he may dream the better. His dream discloses to him his future destiny and his fortunes through life; and the celestial admonitions which are thus conveyed to him direct his course down to the day of his death.† Many curious names owe their origin to these dreams: "Hole in the Sky" was the name of an Indian whose guardian spirit appeared to him in an opening in the heavens.‡ It is essential that this guardian spirit be seen; and the fasting and dreaming must he continued until some animal makes its appearance. After the dreamer awakes, he tracks an animal of the same species, kills it, and carefully preserves the skin, or at least that part which was specially observed in the dream, and this he always carries about with him. To lose it would earn for him the ignominious title of "Man without medicine," and bring upon him untold misfortunes in later years.§ Families and tribes of Indians have also their guardian fetich in the shape of some animal, as a bear, a buffalo, a hawk, an otter, etc., and the Algonquins called this fetich the Totem.* The whole species represented in the totem was exempt from pursuit. Its name was adopted as that of the clan, and when an individual was questioned as to his own name, he would generally, with a sort of family pride, give that of the totem. Marriage was not to to be contracted between those of the same totem, just as the Negroes of Aquapim regard two families whose fetiches bear one name as related, and so forbidden to intermarry.†

The vows taken in honor of the fetich are of course very simple, and have reference merely to external acts. As specimens of different vows taken in Loango, Dapper gives the following, in addition to a series of minute directions as to costume: ‡ Not to eat such or such flesh, birds, fishes; such or such herbs, fruits, etc.: or if one ate of them, to do so all alone and afterward to bury the bones. Others bound themselves never to pass over water, even were the same in small quantity, or had fallen in the shape of rain, or had come from any other source. Others again were not to cross a river in a boat with their shoes on, though they might wade or cross on the back of an animal. Some were required to wear the hair of the head unshorn, others might cut off that as well as the beard, while others still were allowed to cut off only the one or the other. Some were not permitted to eat fruits, while others were required to eat all they got, and to refuse a share to any one,

* Bastian, 254.

† See examples of such dreams in Kohl, Kitchi-Gami, oder Erzählungen vom oberen See. Bremen, 1859.

‡ Schoolcraft, II. 160.

§ Catlin, Letters and Notes on the N. A. Indians, 4th Ed. Lond. 1844; Waitz, Anthr. III. 118; Charlevoix, p. 346; Hist. Buccaneers of America. Lond. 1741, I. 116; Lettres édifiantes, VI. 174.

* Waitz, Anthr. III. 119.

† Bas. Miss. Magazine, 1852, IV. 327.

‡ *Cf.* Dupuy, Journ. of a Resid. in Ashantee. Lond. 1824, p. 239; Bosmann, II. 66; Proyart, 195; Bowdich, 362, 524; Tuckey, Narr. of Exped. to explore Riv. Zaire in 1816. Lond. 1818, 124, 223.

no matter how much they had.* The Yagas (a tribe of warlike African savages) imposed upon themselves, according to Cavazzi,† strenuous practices of abstinence, similar to those found among American Indians, with a view to render themselves the worthy champions of the sacred Quixilles; and they thought that they entered the strife in earnest only after the first captive had been put to death as an atonement for the sins of the tribe. The sanctity of the royal palace was so rigidly maintained among them, that when once a baptized infant was by its mother brought within the enclosure, the chief ordered the palace to be torn down, burnt, and leveled with the ground, for such a profanation necessitated the erection of a new one. The flesh of swine, elephants and snakes was forbidden to the Yagas, and they would no more touch it than would the Australian touch the flesh of his kobong. Unfavorable seasons were ascribed to the indignation of the gods on account of the people's sins. Thus these savages, who sucked the brains out of the heads of their living foes, and who, by public licentiousness, cannibalism and infanticide, violated every article of the moral code, even they had an ideal which they called Virtue.‡ When on the Gold Coast the members of a family separate from one another, and they can no longer worship in common the family fetich, then the priest destroys the latter and prepares from it a draught, to be taken by them: and so the fetich enters their bodies. At the same time certain prohibitions as to food are enjoined, the observance of which is a religious duty.§

Thus each savage has his special guardian fetich and his own peculiar vows; thus, too, each has a religious belief peculiar to himself, and the principles governing his conduct in sundry contingencies are the reverse of those held by his neighbors. Consequently he must regard his neighbor's conduct as smacking of heresy, and his neighbor's person as a thing unclean. "The diversity of Mokissos made it necessary in the great caravanserai in the market-place of Loango that each person should bring his own cup from which to drink the palm-wine, so as not to be exposed to the danger of drinking unawares out of a heterodox cup." *

"In what manner soever the Mokisso has been selected, the whole after life of his worshiper is bound up in him. This is the source of all true contentment for the savage, and here he finds the solution of all those anxious questions which arise in his mind no less than in that of other men, who would be but ill content, however, with the very simple solution accepted by the Negro. The vow he has undertaken is for him the sum total of religion. So long as things go pleasantly for him, he is happy and contented under the guardianship of his Mokisso; he feels strong in the assurance of divine approval; ascribes to the divine complacency, his days of sunshine; indeed his judgment is strictly controlled by his wishes and desires. But if unintentionally or involuntarily he breaks his vow, the whole course of providence in his regard is at once and irrevocably altered. Then misfortune overtakes him; he is quickly overwhelmed with calamities, and his only escape lies through death and oblivion; for him there is no hope, no path leading to reconciliation and deliverance. The luckless wretch need not, in Africa at least, go far in search of death. The fiends who surround him, in the shape of fellow-men, quickly trample him to death, and with the last breath of the fetich-worshiper expires a System of the Universe, in smallest 12 mo. With the man perishes the god he himself made, and both go back into the night of Noth-

* Bastian, 253.

† *Ib.* 205 ff; Cavazzi, Relat. histor. de l'Ethiop. occid., trad. d. l'Ital. par le P. Labat. Paris, 1732.

‡ Bastian, 205 ff.; Cavazzi, *ubi supra.*

§ Cruikshank, 220.

* Bastian, 258.

ingness. Here, too, is shown the might of inexorable Fate. The devotee made the Mokisso what it was: but the Mokisso was bound to avenge the infraction of his commands; he annihilates his worshiper, and with him annihilates himself." *

But let us suppose that the savage observes his vow. "By studying the Negro when swelling with pride at his good fortune, we can get an insight into many other features of this kind of worship. His good Genius makes him overweening of himself, and he looks down upon his fellows with disdain; but he may attain a still more exalted degree of eminence, when by his virtues he attracts to his service still other Mokissos. With this view he assumes new vows, and enters into covenants with one Mokisso after another. His faith increases his courage and audacity, and *fortem fortuna adjuvat.* But now his rôle becomes hazardous, as it is difficult to perform the numerous vows he has taken;" † soon it will be quite impossible. But if he omits any, he offends and enrages the slighted fetiches, and the upshot of the matter will be, that he must follow the course we have already described.

The greater the number of the fetiches to which a savage is devoted, and the greater the number of his vows, the more will his time be occupied in paying them reverence. Thus only freemen, the rich and the powerful can afford to have many fetiches or to bind themselves by many obligations. The slave must bestow all his time and attention in his master's service, and the poor are sufficiently occupied in procuring a livelihood: neither of them have leisure for anything beyond the simplest devotions. The higher, therefore, a Negro's rank, the more fetiches he will possess, the more vows he will have to observe, and the more difficult will it be for him to live without offense. Römer fell in with a Negro who owned nearly 20,000 fetiches, many of which, however, he kept merely because they had belonged to his ancestors.* "The princes of Loango receive several years' schooling in a complicated form of fetich-worship, assuming new vows for each degree of initiation; and thus only are they qualified to rank among the Eligible Princes, who alone can ascend the throne. When an adult person is to adopt a new Mokisso, the Ganga is not governed by his own private inspiration, as he is when he imposes a vow on the new-born infant; but he puts himself in sympathetic *rapport* with the postulant, and hearkens to the words spoken by the latter in an ecstasy; and these words determine his choice." † Nor is this of little importance for the postulant and his future happiness. The Ganga might impose on him a vow entirely uncongenial to his tastes and inclinations. In that case, he would soon transgress against his obligations, and incur guilt. But the adult postulant has a well-defined character (if we may so speak of a savage) and the Ganga adapts to this the new fetich and the new vow, thus securing a good understanding between the fetich and the devotee, and insuring the happiness of the latter. Furthermore, "in the fact that the Ganga, in selecting a Mokisso for the new-born infant, takes into account the character of its parents' Mokisso, and seeks to establish between the two a sort of organic connection, we see the earliest effort toward a system transcending the individual." ‡ The power of the savage increases in proportion to the number of vows he faithfully performs, and of the fetiches who give him protection and strength. "Whenever the Ruling House succeed, by means of their fetiches, in establishing a strict line of separation between themselves and the rest of the tribe, they soon assume

* Bastian, 254, 55.
† *Ib.* 256.

* Römer, Guinea, S. 62.
† Bastian, S. 257.
‡ *Ib.* 65.

the most unlimited prerogatives. A prince of the blood may then at will enslave and sell an inferior, whenever he is in want of money."* "In the king of Loango, as being the personification of supreme human felicity, resides the most unlimited authority over the Mokissos, which are themselves the very expression of unbounded Might. It is his will that causes the sun to shine; by his command vegetation proceeds; a word from him were sufficient to annihilate the universe."† On the White Nile, as also in Benin and in Dahomey, a like opinion prevails.‡ For this reason certain exceptionally powerful fetiches, the Sea, for instance, are reserved for those who govern. "The king of Quinsembo has his palace, or Banza, some three miles inland, on the bank of the river Quinsembo, back of a line of sand-hills, and he never passes beyond that line of hills seaward, lest the sea should come within the range of his vision, and he should see it. Were he to behold the sea, the consequence would be his death, and the destruction of the kingdom, as he is forbidden by the fetich to look upon the sea. Many other kings along the coast are similarly restricted, while others will eat only the products of their native soil, and eschew all foreign articles of luxury in their attire."§

The savage puts fetters upon himself, in proportion to the number of vows he undertakes. Thus, the greater his power, as the owner of many fetiches, the more numerous the restrictions put upon his liberty; and so the very fact that he holds unlimited power curiously enough proves in the end his destruction. The dignity of kingship, for instance, involves the service of many fetiches and the performance of many vows. Should the king prove unfaithful, he brings disaster upon himself and upon his kingdom. In Congo if the king's white fez fell off his head, the accident foreboded evil to the state, just as the Japanese Dairi, should he happen by a shake of the head to alter in any way the position of his royal crown, would thereby alter the heavenly course of the sun, whose representative he was. Accordingly, all watch with the eyes of Argus, to see that the ruler discharges his vows. Wo to him if he be negligent! Then those over whom the despot once tyrannized would in turn become his tyrants. Of him may be said what Bastian affirms with regard to the entire Negro race: "No magistrate can by his prohibitions restrict him in the pursuit of his favorite enjoyments; but he will voluntarily take upon himself the shackles of his fetich. No tyrannical despot may prescribe a code of laws to govern his conduct. He makes his home wherever he pleases, and does as he likes, provided only he does not transgress the bounds set by tradition, or depart from the customs handed down from his own ancestors. But *hic hæret aqua:* for these customs surround him like a system of intricate snares, which it is not easy to escape. The slightest offense, when proved against him in a Palaver, is sufficient ground for irrevocably adjudging himself, his family and all his goods confiscated to the king; and the latter will have no scruple in selling him as a slave to the first trader that comes that way."* On the White Nile, when the rain fails, the king is put to death.† Among the Banyars, too, the king, who is also the high-priest—*i.e.*, chief conjurer—is held accountable for national calamities; yet he does not pay the penalty with his life, escaping with a sound pommeling.‡

* *Ibid.* 256.

† *Ibid.* 256; Proyart, 120; Brun-Rollet, in Bulletin de la Soc. géogr. 1852, II. 422.

‡ Palisot-Beauvais *apud* Labarthe, Voy. à la Côte de Guinée, 1803, p. 137 (German tr.).

§ Bastian, 33.

* Bastian, 64.

† Proyart; Brun-Rollet, *ubi supr.*

‡ Hecquard, Reise au die Küste und in das Innere von W. Afrika. Leipz. 1854, S. 78; Waitz, Anthr. II. 129.

In this slavish obedience of the savage to his fetich we may recognize an important educational element. The savage imposes duties on himself—he curbs his passions. Herein he renounces, to a very slight degree, 'tis true, his natural willfulness. His motive is no doubt selfishness. With a view to power, he lays upon himself the burden of obligations. Yet it is a selfishness that is under restraint.

4. *Worship and Sacrifice.*

Such being the power of the fetich, whose good-will brings prosperity, but whose wrath is fatal, the chief study of the savage must be to propitiate him, to gain his favor and to avoid his anger. Now the savage can pay to his fetich only such homage as he is wont to render to those who claim his respect and submission. He shows obedience to his fetich, by performing his vow. He resorts to flattery, prayers, gifts: in other words, he adores his fetich, and offers to him sacrifice.

A man offers prayer and sacrifice, either in order to obtain the blessings of prosperity, or in thanksgiving for benefits received. The desire of a tranquil life is the direct expression of man's natural instinct of self-preservation. This instinct remains unchanged, whatever may be his grade in point of development and whatever may be the means which he chooses for the attainment of tranquillity. All men desire *εὖ πράττειν*, if not in this world, at least in the world to come. Knowledge, however, varies and grows. With the advance of knowledge, the objects which in a ruder age were worshiped as conferring the *εὖ πράττειν* are changed for others. Hence the objects of worship in the different degrees of mental development vary widely: thus we have fetiches, the stars, gods, etc.; and yet the expression of the natural desire of prosperity is ever the same, viz., prayer and sacrifice, though in outward form there may be wide diversity, according to the degree of intellectual and moral culture.

The savage pays worship to his fetiches. The Negroes testified their respect for the anchor. The Ostiaks do honor to illustrious mountains and trees by shooting an arrow at them as they pass by. The Daurians planted rough posts in the center of their huts, winding around them the intestines of animals, and the occupants of the hut never passed by the fetich without a prostration and a prayer.* The Circassians slay a goat at the grave of a dead kinsman, consume the flesh, hang the skin on a stake, and make it an object of worship.† The offerings made to the fetich are often of very trifling value, being proportioned to the wealth of the devotee. Thus the Negroes and the *early* Peruvians, as also other American natives,‡ and the Siberians § seldom offer anything but potsherds, worthless rags, and worn-out boots and shoes. The Ostiaks clothe in silk their fetiches, which are made to resemble the human form, and to one side of the head they attach a bunch of hair, to the other a dish, into which they every day pour broth, which then flows down either side of the idol.‖ As a sign of their gratitude, the natives of Cabende eject from their mouths upon the fetich the first morsel of food they take at a meal, having first chewed it: and the idol is left unwashed and in this pitiable state until the meal is at an end.¶ Many fetiches have also localities specially assigned to them, where they receive offerings, and we find fetich altars of various descriptions.

Offerings are made to the fetiches with a view to obtain benefits from them. Thus the Negroes offer to their fetiches empty jugs when they wish

* Voy. au Nord. VIII. 103.

† *Ib.* X. 447. Isbrand affirms the same as to the Burats. Voy. au Nord. VIII. 64.

‡ Acosta, Hist. natur. et mor. des Indes occidentales. Paris, 1606, p. 206, 227; Charlevoix, 348.

§ Georgi, Russ. Völk. S. 389.

‖ Isbrand, Voy. au Nord. VII. 38.

¶ Bastian, 81. *Cf.* Halleur, 32.

for rain; swords or daggers when they are going to war; fish-bones when they are bound on a fishing-expedition; small shears or knives when they desire store of palm-wine.* The savage is most liberal of his homage and of his gifts when he is in straits, but often times the fetich is utterly neglected in time of prosperity.† Finally, offering is made to the fetich, in thanksgiving for benefits received, after a successful fishing-expedition or warlike foray; after a prosperous chase or harvest; after the birth of a child; after recovery from sickness, and escape from danger.‡

Animals and even human beings § are offered to the fetiches. On perilous routes and rivers the American Indians make offerings of birds or of dogs, sometimes binding the legs of the latter together, and leaving them suspended from a tree to meet their fate.‖ To such fetiches as bears or deer they offer maize; and to a maize-fetich they offer bears' flesh.¶ "In Bonny the most beautiful maiden is annually offered to Ihu-Ihu, or Yoo-Yoo**—a name denoting priest, temple, or place of sacrifice, as well as any guardian deity. Probably it here stands for the Sea, to which an offering is ever made on a fixed day. The maid chosen to be offered to the god has her every wish gratified, and whatsoever she touches becomes her property.†† The priest who performs the human sacrifices, bites a piece out of the neck of the victim, while life still remains. When captives are sacrificed, their heads are arranged in a row in front of the Yoo-Yoo house, and the remainder of the bodies are cut up, boiled in a cauldron and eaten.* The Kroos also occasionally sacrifice prisoners of war to their fetich-tree.† "They have many festivals whereon sacrifice is offered to the fetiches. Even days become fetiches for them, some being regarded as lucky, others as unlucky. In Ashantee there are but 150 or 160 lucky days in the whole year, when an enterprise of moment may be commenced with any hope of success.‡ On the Senegal Tuesday and Sunday are *dies atri*, but Friday is a still more unlucky day, and hence a certain Bambarra king had all children born to him on a Friday put to death.§

As a mark of respect for the fetiches their worshipers build houses to shelter them, temples. The Wotiaks ‖ and the Ostiaks ¶ build for this purpose miserable huts, but the Abipones** and the Negroes affect some small regard for ornament. Bastian gives the following description of an African fetich-house: "The temple was quadrangular, constructed of straw matting, the entire front being of wooden framework, with three arched doorways. Each of the two side-doorways was surmounted by a pyramid, while over the middle one rose a cupola; and the door-posts were adorned with figures in black and green. Within was a simple mound of earth, on which stood three forked sticks painted red and white in alternate stripes."††

The Yoo-Yoo house in Bonny is 40 feet in length and 30 in width. At one end stands an altar 3 feet high, and a small table with a vessel holding *tombo*, a kind of spirituous drink.

*G. Loyer, Relat. du Voy. du Royaume d'Issiny. Par. 1714, p. 248.

† Charlevoix, 347; Bosmann, 445.

‡ De Bry, VI. 20; Loyer, 248; Charlevoix, 348; Georgi, 389; Valentyn, Oud en Nieuw-oost Indien. Amsterdam, 1724, III, 10.

§ Charlevoix, 118; Georgi, 338; Valentyn, III. 10.

‖ Charlevoix, 118, 348. *Cf.* Waitz, II. 207.

¶ Loskiel, Gesch. der Mission der evangel. Brüder unter den Indian. in N. Amerika. Barby, 1789, S. 53.

** Holman, Voyage round the World (1827–32). Lond. 1834, I. 378.

†† J. Smith, Trade and Travels in the Gulf of Guinea. London, 1851, p. 60, 68.

* *Ibid.* p. 82.

† Waitz, Anthr. II, 197 seq.

‡ Bowdich, p. 363 seq.; Dupuy, 213 *note*.

§ Raffenel, p. 183; Mungo Park, Sec. Journey (in Bütner's translation). Nordhausen, 1821, S. 315. *Cf.* Waitz, II. 201.

‖ Rytschkow, Tagebuch, S. 166.

¶ Voy. au Nord. VIII. 103.

** Dobrizhofer, II. 99.

†† Bastian, 50.

There is abundance of wine and rum in glasses and flagons, and on the walls hang pictures, chiefly representing the Guana lizard. The foreigner is waited on by a priest; for in Bonny strangers have ready access to the temple, whereas elsewhere he is excluded. The priestly attendant mutters a few unintelligible words, makes a mark with moist clay between the visitor's eye-brows, and rings a bell. A glass of tombo is then handed to the stranger, and thus he is admitted to the mysteries, and initiated.* These fetich-houses are in many parts of Africa, asylums, especially for runaway slaves; † and in the medicine-huts of the American Indians even an enemy's life is safe.‡

Having done due honor to his fetich and made to him such offerings as his means allowed, the savage counts with certainty on a return. For though he stands in great awe of his fetich, still the relation between the two is not such as to make the devotee in all cases the bounden slave of the object he worships; nor is the fetich, when the worst comes, the superior of the man. The savage is too wild and passionate to submit to such absolute control; and the moral character which he attributes to his divinity is not such as to make the latter a paramount Destiny. A man's apprehension of another being cannot transcend the sum total of his actual conceptions. He cannot conceive of a being as possessed of attributes of which he has never formed any notion. Consequently the savage's fetich will be what the savage is himself. Now the savage is given to falsehood and treachery; he is usually cruel, selfish and wayward. From what he is himself he judges of human nature, and these same data make up his conception of the fetich. From a moral point of view the fetich is no better than himself; like his worshiper, the fetich is a savage, and on occasion is to be treated as a mere savage. So, if despite prayers and gifts he refuses to grant what is asked of him, then he is to be handled roughly till he yield to force what he denies to entreaty. We have already seen how the fetich is pommeled in order to make him attend seriously to his business.* If the Ostiaks are unsuccessful in the chase or in fishing, they inflict severe chastisement on their fetiches for having led them away from the game, or for having failed to render assistance. The punishment over, they become reconciled again with the unfortunate culprits, give them a new suit of clothes and other gifts, in the hope that they will now do better. During the prevalence of an epidemic the natives of Kakongo entreated the fetiches for relief; but as the pestilence continued, they threw their fetiches into the fire.† The same was done by a Lapp who had in vain prayed to his fetich to perserve his reindeers from disease.‡

As the savage renounces fetiches which prove of no account, so he strives to get possession of those whose power is known. The fetich thus becomes an article of commerce and barter; and numerous instances might be cited of such articles being sold, exchanged, or even stolen.§ It is chiefly the priests that carry on this traffic; ‖ and both in Africa and in America the price of valuable fetiches is very high; indeed their owners are rarely willing to part with them at any price.¶

* J. Smith, p. 60.

† Bowdich, p. 361; Monrad, 44.

‡ McCoy, Hist. Baptist Ind. Missions. Washington, 1840, p. 195; Perrin du Lac, Reise in die beiden Louisianen (1801–3). Leipz. 1807, I. 171.

* The Cingalese have the same custom. *Vide* Knox, Histor. Relation of the I. of Ceylon. Lond. 1681, p. 83. Also the Madagascans. Flacourt, Hist. de la grande I. de Madagascar, 1658, p. 181; the Easter Islanders, Georgi, 385; the Ostiaks, Voy. au N. VIII. 413.

† Prøyart, 310.

‡ Hoyström, S. 319. *Cf.* Waitz, Anthr. II. 185.

§ Bosmann, S. 99; Atkins, Voy. to Guinea, Brazil and the W. Indies. Lond. 1737, p. 104; Charlevoix, p. 347. *Cf.* Waitz, *ubi supra.*

‖ See following section.

¶ *Cf.* Waitz, III. 214.

5. *Fetich Priesthoods.*

Starting from small beginnings, but gaining strength as it advances, fetichism at last extends its influence over the whole life of the savage. We have soon no end of fetiches and fetich usages, the knowledge and understanding of which requires study, and can be acquired only by the initiated and those who devote their lives to this special branch of learning. The mere layman is quite inadequate to treat of so complicated a subject without making fatal errors. Only wise men are competent to expound so abstruse a science. The man who knows all the fetiches and the entire ritual, is by this very knowledge distinguished from the profane and ignorant multitude · he is an eminent and reverend personage, as being master of many recondite arts all unknown to the generality. Thus if we take into account the low intellectual status of the savage, we shall see that those possessed of this mystic science will necessarily come to be regarded as priests, magicians, medicine-men, etc., or in short fetichmen—for all these terms have that one signification. The fetichman's importance and dignity are the natural corollary of the system to which he belongs.

The feticeros are sages. · They understand the entire system, and are familiar with all the fetiches and the mode of preparing them, their respective powers and their names. In America it is the *Jongleurs** (conjurers), in Siberia, the Shamans,† in Africa, the Gangas ‡ (different titles for fetichmen) that supply all the fetiches. That the trade in fetiches is remunerative we may judge from the fact that each Indian village has twenty or more fetichmen and women who thence get a living. In Africa, too, this trade yields a fair income.§

The fetichmen are also familiar with the ceremonies to be used in order that the fetich may be induced to exert his full power. They "know all the potent formulas for blessing the elements."* The safest course to pursue, therefore, is to have the feticeros themselves apply the fetich. Hence, the priest's influence is coextensive with that of the fetich. In assigning powerful fetiches for the cure of disease, and in applying these, he acts the part of a physician. When by his fetiches he constrains thieves, the winds, the clouds, spirits, etc., to do his bidding, he becomes a conjurer, or magician. Finally, inasmuch as he has special control over religious rites and sacrifices, and thus comes into close relations with the fetiches, he is strictly a priest. Yet at bottom all these functions are identical and are all implied in the one title of *fetichman*. The distinction, therefore, sometimes made between the fetich-priest and the conjurer is merely a relative one, as Bastian has well observed.† Hence among some inconsiderable Eskimo tribes a single priest will combine in his own person the various functions of the feticero, being at once physician, conjurer and priest, while under other conditions a division of labor takes place, determined by chance or by inclination. Thus in Negro tribes one fetichman devotes himself to the medicine-fetiches, and is a physician; another professes the art of rain-making, or some other branch of conjuring; a third is devoted chiefly to the ceremonies of religion. In North America the Jongleurs give counsel as to the manner of appeasing the fetiches or gaining their good-will, but do not offer sacrifice. This function is discharged by the chief on behalf of the tribe, and by the father on behalf of the family.‡ The same is stated as to the Tcheremissians and other Tartar tribes.§ On the other hand, in

* Charlevoix, p. 346; Lettres édif. VI. 174.
† Georgi, S. 384.
‡ Des Marchais, I. 296.
§ Waitz, II. 196, III. 213.

* Bastian, 85.
† *Ibid.*
‡ Charlevoix, Journ. Hist. d'un. Voy. de l'Am. Sept. p. 364.
§ Rytschkow, S. 92, 93.

sundry tribes of Siberians,* Kirghis † and Negroes ‡ the conjurers offer sacrifice. The Calmyks § and many Negro ‖ tribes recognize a distinction between conjurers and priests, while in some African and American tribes ¶ the conjurers assume all the functions of priests, and *vice versa*.

Of all the feticeros, those who are priests are usually held in the highest consideration. "Among the Yagas the Gangas have precedence of the Scingilli, or Rain-makers, and it is their duty, when a warlike expedition is to set out, to paint the Grand Yaga red and white, as he awaits the inspiration of the Mokisso, and to hand him his battle-ax, after he has banqueted off the body of an infant slain in sacrifice. When victory is proclaimed the Gangas obtain the trophies of the fallen enemy. At the period of the New Moon they offer the five-fold sacrifice, when, after the sacrificial fire has been sprinkled with the blood, the whole tribe join in a boisterous feast the victims' bones being carefully preserved for magical purposes; as is also the custom among the Tohungas of New Zealand. The Gangas have also to guard from profanation the Quilumbos, into the inner recesses of which no woman is ever admitted, and to expose in the woods the newborn children, as the army, like the corps of Mamelukes, is made up only of young slaves." ** Cavazzi, whose sojourn of 14 years in Angola and Congo gave him the best opportunities for acquiring a knowledge of Negro customs, describes a number of different classes of fetichmen with distinct functions pertaining to each class. The children of a man killed by lightning applied to the *Ganga Amaloco*, to get for themselves protection against a like visitation. The Mutinu-a-maya (Lord of Water) divined by means of a calabash cast into a stream. The *Molonga* prognosticated the issue of disease from boiling water; and the *Neoni* from revelations conveyed to him from his idol, through the mouth of the Nzazi. If these prophecies proved false, the priest laid the blame upon his Familiar Spirit, and procured another. The *Ngodi* professed to give speech to the dumb. The *Amabundu* could shield from harm seed sown in the ground. The *Ganga Mnene* could prevent evil spirits from eating up the grain after it had been harvested. The *Ganga Embugula* could by whistling overpower his enemies. The *Npungu*, the *Cabanzo* and the *Issaen* were associated together in the work of shielding the warriors from wounds, and took one another's places whenever one of themselves happened to be wounded. The *Ngurianambua* could charm elephants into the toils; the *Abacassu*, stampeded cows; and the *Npombolo*, all kinds of wild animals. The wealthy brought their deceased relatives to the *Nganga Matombola*, who by means of his magical figures caused them to rise from the bier, to move their limbs and to walk about.* "On the Gold Coast the *Wongmen* differ from the priests, properly so called. The Wongmen are possessed by the fetich, Wong, and any man may become a wongman provided he has learned to dance to the sound of the drum, to chant the songs which are sung when the oracle is consulted, and to perform the ritual of the medical art. There is another class of fetichmen, the Otutu-men, who also profess the art of healing, and who attend to the Ordeals. Then there are the Gbalo, or Talkers, who summon the spirits and question them. Finally there are the Hongpatchulo, who sell charms to people that wish a curse or an enchantment to befall their enemy. Besides priests some tribes have also priestesses. In the northern Negro countries, where a

* Gmelin, Reise durch Sibir. i. d. Jahren, 1733–37. Gött. 1751, II. 359, 360.
† Pallas, Reisen durch versch. Provinzen d. russ. Reiches. Petersburg, 1771, I. 393, 394.
‡ Oldendorp, I. 339.
§ Pallas, I. 359.
‖ Oldendorp, I. 339.
¶ Acosta, V. c. 26, 248; Cavazzi, I. 253 seqq.
** Bastian, 95.

* *Cf.* Bastian, 201.

nominal Mohammedanism prevails, there is not to be found such a variety of priests and conjuring physicians. Here we find the Marabouts, who, in addition to their priestly office, practice divination and drive a trade in Gree-Grees, though among these are many who have nothing to do with such jugglery, and whose study it is to gain a name for piety and beneficence. Hence the Joloffs make a wide distinction between the true Marabouts and the Thiedos (Unbelievers, Atheists, mercenaries), who believe in nothing save their gree-grees." *

Among the Kaffirs, too, the Conjurers, Inyanga, are divided into several classes, the highest being that of the Izanuse, or "Smellers," who extract the witchcraft from the sick by sniffing; while the inferior classes embrace the cow-doctors, the farriers and the fellers of timber.†

The conjurer-doctors, or medicine-men, who are common to Africa, Asia and America, either blow their breath upon that portion of the patient's body where the fetich locates the disorder, or rather the enchantment; or they resort to suction, friction or pressure on the diseased part, until finally they drive out the spell, which makes its appearance in the shape of hair, splinters of wood, thorns, bones, snakes' teeth, and the like.‡ They prescribe for their patients formidable remedies and regulate their diet. Should the sick man die they throw the blame upon him, as not having exactly carried out their prescriptions. If they see no chance of a patient's recovery they prescribe a course of treatment which he cannot possibly follow, such as violent jumping, or dancing, and thus they escape all responsibility for his death.* The Hottentot poison-doctors are famous. No snake can sting them, and not alone can they heal the bites of serpents by their sweat, but they can confer on others the same power.† A priest-physician in Congo had in his establishment five women to treat various diseases. His pharmacopœia, however, had but few medicaments for any complaint save for the *Mal Francez;* but abundance of magical formulæ.‡

As a matter of course, the fetich-priests are soothsayers, and the mouth-pieces of the oracles. The Lappish and Siberian Shamans divine by means of a ring which they place on the head of a magical drum. They beat a certain number of taps on the instrument and then observe on which one of the figures painted on the drum-head, the ring stands. Each figure has a special significance; and as this is known only to the priests themselves, the response will be whatever they choose to make it. Teleutian, Sajanian and Abinzian soothsayers divine by means of 40 small rods thrown upon the head of a magic drum; the Tungoos from the whir of tarrows shot from the bow, or from the vibrations of a tense bowstring.§ The N. American Jongleurs set fire to pulverized cedar charcoal, and divine from the direction in which the fire travels.‖

In Africa, the Npindi conjured the weather at the intersection of roadways. "The Rain-makers have at all times, and among every people, acted an important part, and many African populations invested their princes with this dignity, which was often as

* Waitz, II. 199.

† *Ibid.* 412.

‡ Greenlanders, Cranz, S. 270–74; Am. Ind., Charlevoix, 264–268; Hennepin, in Voy. au N. V. 293; California Ind. Begert, 142; Natchez, Petit, Relations, etc, in Voy. au N. IX. 26; Caribs, Biet, p. 387; Gumilla, hist. de l'Orinoque Avigum, 1708, II. 185; Du Tertre, Hist. gen. des Antilles, II. 366 seq.; Brazilians, Lery, p. 242–47. *Cf. supra,* Section II.

* Charlevoix, p. 368. Des qu'ils voyent un malade tourner à la mort, ils ne manquent jamais de faire une ordonnance dont l'exécution est si difficile, qu'ils ont à coup sûr leur recours sur ce qu'elle n'a pas été exactement suivie.

† Steedman, Thompson, v. Meyer, Reise in S. Afrika (1840). Hamb. 1843, S. 158; Kretzschmar, S. Afr. Skizzen. Leipz. 1853, 167 ff. *Cf.* Waitz, III. 213.

‡ Bastian, 202.

§ Georgi, Beschreib. S. 395.

‖ Charlevoix, p. 363.

full of danger for them as was the power over the harvests for the ancient kings of Sweden. The Emperor of China devolves upon his subjects the responsibility for his lack of power in this regard, assigning as the reason their wickedness. The hair and nails are plucked from the body of the Mani of Jumba, after his death, and preserved as infallible rain-makers. The Makoko of the Anzikos wished to get for the like purpose one-half of the beard worn by the missionaries; and would even agree to undergo the ceremony of baptism as the price of so potent a charm, just as the despot of Benin agreed to pay the same price for a white wife."* Bastian thus describes the manner of conjuring the rain; "The sky was overcast and the thunder rolled above the mountain-tops; but when I expressed my fears of a storm, my guide assured me that I need have no apprehension, as one of the officials who accompanied me was an accomplished rain-conjurer, and he had promised that he would not permit a single drop to fall. I was fain to accept the assurance, and the more so, as I saw my Zeus Aetherius rise to his feet, shake his raven locks, extend his hand menacingly toward the clouds, and point with his finger in every direction. My carriers, who looked on devoutly, thought the ceremony was now at an end, and made off with the tipoja (mat-palanquin): but scarce had we left the tree, beneath which I had hoped to be sheltered from the rain, when the floodgates of heaven were opened, and in an instant I was drenched to the skin."† Rain-makers are to be found everywhere in Africa, as, for instance, among the Bushmen‡ and the Kaffirs,§ who at first took the missionaries to be a new kind of rain-makers.

"The wind-maker, too, is an important personage ever since the Negroes have become accustomed to use European manufactures; as any delay in the arrival of the merchant-vessels may occasion suffering to the natives. Inasmuch as they do not themselves tempt the deep, the conjurer could find no market among them for Lappish Æolus-sacks; and instead, he retires into his hut, which smokes and rocks while he is engaged inside with his redoubtable incantations, conjuring up the favoring breezes which shall conduct to their shores the fleets of the white men."*

Such is the power which the feticero possesses over Nature, over Spirits, men and beasts.† The common people have full faith in this power; and as the priest himself is no less a savage than they, his faith is the same. Should his incantations fail to produce the desired effect, he accounts for the failure by supposing that counter incantations have been at work, or that the ritual has not been strictly observed, and this explanation satisfies not alone others, but also himself. There are even at this day plenty of people in civilized Europe who tell fortunes, who practice necromancy, who profess to cure diseases by the imposition of hands and other similar means; and who are themselves no less deceived than those who employ them. The records of courts of justice and the reports of asylums for the insane are sufficient evidence of this. "The Cazembe now in highest repute regards himself as immortal by reason of his magic arts, and says that his predecessor's death was due to a want of precaution. He is possessed of such an excess of magic power that its superabundance would at once annihilate whosoever should come in contact with him; and there is accordingly a curious ceremonial to be observed, in order to avoid such consequences. This ceremonial would almost appear as though plagiarized from the animal-magnetizers. In their system it is called

* Bastian, 116, 117, 118.
† *Ibid.*
‡ Lichtenstein, II. 102.
§ Campbell, 2nd Journey, 230, 236, 238; Thompson, Trav. and Adv. in S. Afr. I. 180.

* Bastian, *ub. supr.*
† Waitz, V. 1, 178.

Dorsal Manipulation, and its purpose is to re-isolate the somnambulic subject."*

Undoubtedly the priests are the first to detect the imposture and to discover the impotence of their idols and of their own arts. Still, lest the people should be shocked by the publication of this discovery, the priest will keep it to himself, henceforth acting the part of a conscious deceiver, from motives of selfish interest and ambition. With this view he will surround himself with a veil of mystery, and resort to all manner of tricks and fraud.

"The only kind of historic record to be found among African tribes is the traditional narrative of important events, and this is handed down from one fetich priest to another as a secret of the craft. Accordingly, when application is made to the priests for counsel, the knowledge which they possess of the past history of the various families of the tribe, gains for them the credit of inspiration." † They alone are privileged to hold converse with the great dread fetich who dwells in the recesses of the forest, and to tread the floor of his home, without being torn in pieces.‡ They are not men of the common mold; their origin is enveloped in mystery. Among the Dakotas the medicine-men and medicine-women first come into the world in the shape of pinnate seeds, something like the seeds of the thistle. Then they are driven about by the winds and thus come into relations with mighty spirits, whose preternatural science and power they make their own. Next they gain entrance into the womb of a woman, and in due time are born with human bodies; though after death they return to the society of the gods. After they have four times run their career in human shape they are annihilated. They may likewise be transformed into wild beasts.§ They can also cause ghosts to appear on occasion, to inspire the vulgar with due respect for the fetich and for his retreat in the woods. "The village was situate on the edge of a dense forest, and on learning that in the forest there was a fetich-house, I directed my men to advance by a circuitous foot-path leading to it. They stoutly refused, saying that not one of them could come back alive; and it was only by repeated threats that I could induce them to move. But as soon as the villagers were aware of my purpose, they surrounded my mat-palanquin *en masse*, entreating me not to expose myself to destruction: and threw themselves before the feet of my carriers, to prevent their advancing—a very unnecessary thing to do, as the carriers themselves showed no disposition to go forward. However, as I longed to examine a second fetich-house, I paid no attention to their entreaties, pushed back those that stood close around my palanquin, and repeated my command to move on, with some emphasis. The whole multitude then uttered the most pitiable cries. The women tore their hair, and beat their breasts, and the seniors rolled themselves in the dust alongside the palanquin, invoking the power of heaven and earth to check my progress. I was at length obliged to yield. As we went up the ravine which skirted the forest there went up a fearful bellowing, which seemed to issue now from one quarter, again from another, and which imitated all manner of indescribable noises. The Negroes, terrified by this outburst of fetich indignation, ran in all speed from the locality, to escape from the wrath of the god · for there great Pan is not yet dead." * The Great Spirit of the Shekani and the Bakele dwells in the bowels of the earth. At times he comes forth, and takes up his dwelling in a great house which has been built for him, and there he utters such frightful bellowings that

* Bastian, 293.
† *Ibid.* 100.
‡ Lettres édif. IX. 95; Dobrizhofer, II. 99.
§ Waitz, II. 180, 504; V. 2, 178.

* Bastian, 193.

women and children tremble with fear.*

The priests are deeply versed in the science of ghostly apparitions. "The Spirit-seers of America might get from African professors many practical rules for the converse with Spirits, which they could readily turn into hard cash. But they must make haste, for the courts of justice at Cape Coast Castle are beginning to shed light upon the mystic cloud of secrecy which involves Negro spiritism, and have already condemned more than one unmasked fetichman as an impostor. As society assumes definite shape in the colony, the more dangerous fetich practices are more and more brought under the control of the law; and the peaceable citizens adopt the policy of favoring and strengthening the Mylah ceremonial in opposition to that of the Obeah; thus, in the words of S. Augustine, patronizing *theurgy* in order to discredit *goety*." †

Nor must we omit to take note of the ceremonies performed by the feticeros. These are usually conducted in the most fearful style of wild and boisterous frenzy. In proportion as the rational faculty is developed, a man controls more and more the external bodily signs of emotion. His power of speech has attained that degree of perfectionment, that he can readily convey to others by that means all his sensations: he uses *language*. But the lower the grade of mental development, the weaker is the power of expressing in words the sensations and emotions of the mind. Clowns and children speak by means of gesture, and their whole body seems to express their emotions. With the savage accordingly, whose language is fragmentary, the lack of verbal expression must be made up by violent gesticulation. When the King of Dahomey would do honor to a foreign guest by chanting a song of praise, he must also give proof at the same time of his saltatory skill. When Bastian was entertained by the king of Shemba-Shemba, that potentate simply kept up a movement of the feet *a tempo*, and made frequent genuflections, in performing which he would slip partly out of his seat, and give his little cap of bast a graceful toss on his poll. Several nations resort to the mimic hieroglyph language of the dance.* It need not occasion surprise, then, if the savage, when under the stress of violent emotions, finds expression less in language than in cries and shouts, wild gestures, leaping and rolling on the ground. We have already seen many examples of this.† But whence does the priest or the conjurer derive his power over the objects against which his conjuring arts are directed? This power comes from his fetiches. They must endow him with the power they themselves possess and must in his person make display of it. Accordingly the conjurer becomes transformed, and pssessed of unwonted strength. He has to manifest the presence and efficiency of the Power which possesses him, and the expression which he gives to it, is the same as that by which he gives utterance to every strong and passionate emotion, viz., the wildest and most violent convulsive movements of the body. Maniacs are by savages regarded with great alarm, as being possessed by spirits.‡ It is perfectly natural, therefore, that the conjurer, when possessed by the spirit of the fetich, should become for the time being a maniac. When the priest has wrought his mind into the last degree of frenzy, he is judged then to have attained the height of his magic power, and to manifest to its full extent the dread might of the fetich. It is therefore the business of the priest to know how to arouse himself to this state of frenzy. If nature qualifies him for the task, so much the better; and for this reason the

* Wilson, Western Africa, etc., p. 391.
† Bastian, 101, 85.

* Bastian, 56.
† *Cf.* Waitz, II. 205 seq. 223.
‡ Georgi, Beschreibung, S. 376; Gmelin, IV. 109.

priests select children who are epileptics, to be trained to the priestly functions.* "The Shamans pass into the state of madness by a super-excitation of the motor system, and at the same time often become the subjects of hallucination, accompanied by complete mental alienation, owing to spiritual excitement. By careful training, children of feeble nervous constitution are educated to pass readily into this state of alienation and phantasy, and so attain in this art a degree of perfection unattainable under any other conditions. Just as jugglers perform feats of skill which fill us with astonishment, though an anatomist will show you, from the arrangement of the muscles, how such sleights are rendered possible: so the Shamans are a kind of psychical jugglers, who have in childhood been trained to perform several abnormal mental operations, which we neither can nor would imitate, or even countenance. On the contrary, we suppress all tendencies in that direction as quickly as they manifest themselves. But there may even be *normal* mental operations well-developed in the savage, which we lack; just as we lack some of his physical accomplishments, for instance, the power of employing the toes in place of the fingers, for the purpose of weaving, grasping, etc.: a faculty possessed by the Cochin-Chinese, Polynesians and other races." †

This faculty of psychical jugglery is enlarged by hereditary transmission. Inasmuch as epilepsy is heritable, it is not unusual for the office of Shaman to be handed down from father to son for from four to six generations, and a Shaman is esteemed in proportion to the antiquity of his Shaman ancestry.* The dexterity of the Shamans in performing their feats of psychical jugglery we may learn from the account given by Carver. He saw an elderly member of "the Friendly Society of the Spirit," which is an association of fetich-priests, throw at a young man who was to be elected into the society, a bean, or something that had the shape and color of a bean. "Instantly he fell motionless, as if he had been shot." He remained insensible for a considerable time, until he was brought to his senses by means of very violent friction and even blows. And even then, consciousness returned only after he had passed through a series of the most fearful convulsive fits.† The witches also, in the middle ages, fell to the ground, as though dead, when forced to anoint themselves with their witch's salve.‡ In proportion as the priestly office, having taken root in society, becomes a heritable privilege, and as the nervous predisposition, which at an earlier period determined the selection of the candidate, is lost under the influence of prosperity, the more difficult does it become to bring about the state of ecstasy by means of convulsive operations, and then resort has to be made to sundry contrivances, viz.: deafening music, violent jumping, inhalation of narcotic vapors, the repetition of monotonous sounds, excessive transpiration, protracted abstinence from food, partial strangulation, etc. These methods are universally employed by fetich-priests, to attain their purpose. The Jongleurs of the American Continent practice such contortions of body, and utter such hideous cries, that not alone the spectators are filled with consternation,§ but even women and

* As to the Siberians, Georgi, *ub. sup.*; Patagonians, Falkner, Descr. Patagon. Lond. 1774, p. 117: "They who are seized with fits of the falling sickness or the Chorea Sancti Viti, are immediately selected for this employment, as chosen by the demons themselves: whom they suppose to possess them and to cause all those convulsions and distortions common in epileptic paroxysms; Greenlanders, Cranz, S. 268, 270.

† Bastian, Die Seele u. s. w. S. IX.

* Gmelin, III. 331.

† Carver, Trav. through the Inter. Parts of N. America. Lond. 1778, p. 271, 274.

‡ Bodin, de la Demonomanie des Sorciers. Paris, 1581, p. 96–99; Malleus Malefic. Lugd. 1669, II. 69.

§ Charlevoix, p. 361 seqq.: On les y voit entrer dans des convulsions et des enthousiasmes, prendre des tons de voix et faire des

children at a distance are thrown into convulsions of terror.* By means of similar contortions and shouting the Shamans of Siberia and the African feticeros work themselves up into the state of ecstasy.† To expedite matters they drink tobacco-juice, or resort to exhausting vapor-baths.‡ The Shamans of Siberia drink a decoction of toadstools or the urine of those who have become narcotized by eating that plant.§ The highly excited nervous condition produced in the conjurer by his fearful bodily exercitations is so exhausting that many refuse to go through them, even on promise of a considerable reward.‖ This artificial frenzy has such a seri ous effect upon the body, and more particularly the eyes, that many of the Shamans become blind: a circumstance which enhances the esteem in which they are held.¶

Among the means employed for the purpose of inspiring the beholders with awe we must reckon the attire of the fetichman. And first we have the conjurer's mantle and his magic drum, —apparatus which appear to be wanting to the Shaman men and women of Kamtschatka alone of all the Shamans of Siberia. The drum is a simple sieve, a sheepskin being drawn over one rim, and the inside of the frame having a lot of jingles and little idols suspended from it. The real purpose of this instrument—viz., to deaden the senses by its noise—is very different from that assigned by the Shamans. They assert that the gods and the spirits have a liking for this fearful music, and are attracted by it.* They therefore keep up a drumming until those beings make their appearance; *i. e.* until the drummer himself, by his violent exercise, has passed into the state of ecstasy. The drum is sometimes replaced by a staff hung with bells, or by some other noisy instrument.† The Dakotas, besides the drum and the clappers, employ a notched bone, with which they saw upon the edge of a tin dish: and thus they produce shrill, ear-rending sounds.‡ Isbrand gives the following description of the Shaman's leather conjuring mantle: A sort of long coat (casaque), adorned with pendent figures of iron, representing all kinds of birds, fishes, and wild beasts: arrows, saws, hammers, swords, clubs—in a word, every conceivable thing that is calculated to inspire fear.§ A mantle of this description is so heavy that a strong man can scarce lift it with one hand,‖ and when the Shaman, clothed in this garment, leaps and jumps about with all his might, there arises such a clangor that you might well imagine you had before you some fiend in chains.¶ And the remainder of his equipment is perfectly in keeping with his mantle: his headdress, the plumage of the owl and the eagle, the snake-skins and horns suspended here and there for effect, and the gloves, resembling the paws of a bear. African feticeros trick themselves out with the skins of tigers and lions. They daub their faces with white paint, and the rest of their bodies with other colors; or else they give themselves a true coat of tar and feathers. Then they suspend from their persons a number of little bells, animals' heads, wings and claws; drums, weapons, horns, herbs, roots, etc.** Thus weighted they

actions, qui paraissent au-dessus des forces humaines et qui inspirent aux spectateurs les plus prévenus contre leurs impostures une horreur et un saisissement, dont ils ne sont pas les maîtres.

* De Lery, Hist. d'un Voy. fait en la Terre de Brésil. Génève, 1580, p. 242–47, 298.

† Georgi, Beschr. S. 320, 377, 378; Gmelin, Reisen, I. 285, 397, 398; Isbrand, in Voy. au N. VIII. 56 seqq. · Römer, 57, Bosmann, 260.

‡ Charlevoix, p. 361, 362.

§ Georgi, S. 329.

‖ Charlevoix, p. 362.

¶ Georgi, *ub. sup.*

* Georgi, Beschr. S. 378 and S. 13; Gmelin, II. 49.

† Georgi, S. 13, 378; Gmelin, I. 289.

‡ Schoolcraft, Illustrations, Pl. 75.

§ Isbrand, p. 56; Georgi, Beschr. S. 377; Gmelin, I. 397, 399; II. 83.

‖ *Ibidem.*

¶ Gmelin, I. 398.

** *Ibid.*

dance, howl, scream, and foam, as is related of the conjurers of Thibet: saltitant, torquentur in omnes partes, fremunt, furunt, strident, ululant, etc.* These operations they perform in the mystic gloom of some darksome hut, or in total darkness.† These conjurers often perform tricks of common jugglery. Thus they will perform a trick called "washing with fire," where they dexterously separate the fire from the ashes, suffering only the latter to touch their bodies; or they will tread barefoot upon hot coals, pierce their bodies with arrows, or knives, etc.‡

By such artifices as these the power and influence of the feticeros, which were already secured to them in popular estimation by their intimate converse with the fetiches, are enhanced enormously. The assistance of the fetich priest is indispensable on all occasions, whether public or private, and is always invoked. Hence at Fernando Po the Chief Priest, or Botakimaon, is "a weighty man in the state." Each village has its own Buyeh-rup, who gives counsel in domestic concerns. This Buyeh is, however, a far less important personage than the Botakimaon, at whose residence the Negroes assemble in the season of the Ripe Yams to celebrate the "Custom." It is the Botakimaon who crowns the king. According to Consul Hutchison (in his interesting work, Impressions of Western Africa), "the Botakimaon, previous to the ceremony of coronation, retires into a deep cavern, and there, through the intermediary of a Rukaruko (snake-demon) consults the demon Maon. He brings back to the king the message he receives, sprinkles him with a yellow powder called tsheoko, and puts upon his head the hat his father wore. Having once ascended the throne, the use of cocco (*arum acaule*) and of the flesh of the wild boar and the porcupine is interdicted to him."* The priest is also a jurist, giving judgment on cases where the individual comes in conflict with the laws of the state. "The only concession made in a primitive condition of society to the common weal by the Negro (who in all other respects is absolutely independent), is this, that he accepts the ancient traditions, and acknowledges their binding force: but now, even while he is determined that these shall place the least possible restriction on his liberty, he assigns to them a weight of authority which soon removes them beyond his control. He studies to keep them as far as possible in the background; he never meditates upon them, never strives to determine precisely what they are. The consequence is, that he is soon caught in the toils, and can extricate himself only by the aid of those who are skilled in legal technicalities, i.e., the priests. He thus is at their mercy, and becomes their slave."† In his capacity as jurist the priest administers oaths and conducts the ordeals. This latter function is in their hands an engine of boundless mischief. "As every case of death whose cause is in any way obscure, is ascribed to witchcraft, and the kindred of the deceased are obliged to avenge his death; the priests who conduct the ordeal are invested with formidable powers. The cause of death being obscure, the kinsman of the deceased has no course left, save to follow the directions given by those who are eminently fitted to be his guides. He accordingly applies to the fetichman and inquires of him what foe has done this deed. The priest ascertains dur-

* Cavazzi, II. 183, 196, 251. Same account given of the savage inhabitants of the isth. of Darien, California and Brazil by Wafer, Voyages où l'on trouve une description de l'isthme de Darien (*Apud* Dampier, Voyages, Tom. IV.) p. 176; Lery, 242, 247, 298; Begert, Nachrichten von Californien. Mannheim, 1712, S. 142, 159, 165.

† Alphab. Thibet. p. 243, 244.

‡ Gmelin, II. 87; III. (Vorrede) S. 7; III. 72.

* *Cf.* Bastian, 318, 319. Tsheoko is a vegetable product, obtained, according to Hutchison, by collecting a creamy coat that is found on the waters at the mouth of some small rivers, evaporating the water and forming a chalky mass of the residue.

† Bastian, 167.

ing sleep or in a trance the response he is to make, and names the offender. Next the Ordeal-Water; or the body of the deceased, as the bearers halt before his hut; or the discovery of buried talismans, will put the guilt of the accused beyond question. By decree of the Palaver he is arrested, bound hand and foot, and hewed to pieces: for it is a religious duty, incumbent on every member of the community, to take part in the execution of the culprit. The tyrants of the Zulus availed themselves of this dogma, to further their political aims. On the faith of oracles which accorded with their own desires, they extinguished almost the entire aristocracy of their nation, and grew rich by confiscating the herds of the condemned." *

The priest obtains knowledge of what is to come by inspecting the entrails of victims, or by revelation from the fetich. He may, at his pleasure, predict a favorable or an unfavorable issue for an enterprise; and thus may put a stop to measures of which he disapproves. It is to him also that the fetich makes known his wishes as to what he would have done; and then the priest can forward what enterprise he will. "It is the will and command of the fetich:" such is the formula in which the priest's own desires find expression; and thus they become a law for the deluded people. This exaggeration of the fetich priestly power is specially exemplified in the family of the high-priest of Whida, and in the Chitome of Congo. The Negro of Whida worships, as his greatest fetich, the sacred serpent, of which we will speak in another place. It is death to refuse anything to the priests and priestesses of this fetich. They may carry off for their fetich whatsoever they will — cattle, men, treasure. The high-priest rules supreme, the king being only the chief of his servants.† But this absolute priestly power attains its highest development in the Chitome of Congo. He is not honored as the principal minister of the gods or fetiches: he is himself a god, a fetich. His person is incomparably more sacred than that of any king in Africa: his power greater, and his house more jealously guarded against profane intrusion. He may commit what crimes he will, but no man can so much as call him to account, far less seize his person or inflict punishment. Without his will and assent the king can undertake no business of importance, and no minister of the king can assume office. Newly-appointed governors visit, with a great retinue, the palace of the Chitome, and with all humility beg of him his gracious permission to enter on their duties. The prayer is never granted in the first instance, the Chitome obliging them to wait his pleasure until they have backed up their petition with a respectable amount of gifts. At length he comes forth out of his palace, sprinkles the suppliants with water, strews dust upon them, and orders them to lie on their backs upon the ground. He then treads several times on their bodies, to signify that they are his servants; and exacts from them an oath of implicit and prompt obedience to every command of the Chitome. The humbled governors consider themselves in luck if the high-priest gives them a brand from the sacred fire, which he keeps ever burning. Such brands he sells for the healing and prevention of disease. A portion of all the products of the field belongs to the Chitome. It is by his power that the universe is upheld — but here, too, unlimited power has its peculiar disadvantages. For since the universe is upheld only by the Chitome, and, were he to die, would undoubtedly go to destruction, therefore the Chitome must never die. Accordingly, when he falls dangerously sick, his successor forces his way into the palace, provided with a club and a halter; with the one or the other of which the Chitome is dispatched, as

* Bastian, 91.

† Bosmann, 458 ff.; Des Marchais, II. 144, 153.

he himself may elect. The old Chitome, having been by this act of high-handed violence put out of the way, his assassin is now Chitome, (le roi est mort: vive le roi!) and the universe is safe.* The Chitome is himself a fetich: all other fetich-priests base their authority upon the fetiches they possess, as do those of Whida, for instance, upon the Holy Serpent. Among the Kramantees a priest's successor is always that one of his sons who has the courage to take out of his dying father's mouth certain kernels, and to put them at once into his own.

Since the priests, by their conjuring arts, can do what they please, the people, when want or calamity oppresses them, attribute all their woes to the malice of their spiritual rulers. If they can but make away with the assumed cause, they believe that the effect will cease: and thus the belief in the power of the priest, which before brought him only advantage, now turns to his injury. The princes of the Kaffirs put to death all the conjurers they can lay hold of, whenever the country is visited by an obstinate and dangerous epidemic.† The Chiquites of Paraguay, having discovered that the priests do more mischief than good, exterminated them *en masse*. Still they continued in the belief that all diseases are brought on by magical arts. Lest, therefore, the people should be deprived in sickness of the assistance which used to be rendered by the conjurers the chiefs now practice the healing art, using the same forms previously used by the priests.‡ The extraordinary power wielded by the priests, makes them very bloodsuckers and tyrants; and the only remedy against their despotism is when the downtrodden people break their fetters, and take a fearful revenge. The arrogance of the priests of Whida led them to form a conspiracy against the king. But now the people forgot that a priest's person is sacred: the magnates of the kingdom, with one accord, rose to defend their prince, and a general and bloody persecution of the guilty priesthood was commenced.*

But the influence of the priest extends not alone to great affairs but even to the trifling concerns of private life. A man cannot take possession of a hut until it has first been exorcised of the powers of evil by the priest. For this purpose he must dwell in it for a season, purifying it by thurifications, and consecrating it to some guardian fetich.† In Congo he gives his sanction to marriage by giving to the pair two hens, to be dressed by bride and bridegroom respectively; that dressed by the bride to be eaten by the groom and *vice versa*.‡ When the wife finds herself *enceinte* she places herself and her unborn child under the protection of a fetich. "In Western Africa she makes an offering to the priest of a flagon of rum, and a certain quantity of cowries, and in return he fastens around her arm a bracelet made of the tail-feathers of a parrot." § "Between the 10th and the 12th year of their age the children are consecrated by the fetich-priest. The children to be consecrated assemble around the fetich-tree of their neighborhood, and then the priest offers to the fetich a white hen, by cutting off its head and suffering the blood to drop on the ground. He then distributes the feathers among the children, who form a circle all round, and lights a fire to prepare the hen for the fetich. The fetich gets a small portion and the remainder is taken to the house of the priest. With shouts and songs they then proceed to the

* Cavazzi, I. 254.

† Sparmann, R. nach dem Vorgebirge der guten Hoffmung im Jahre, 1772 (tr. from the Swedish). S. 198, 199. The Patagonians acted in like manner, on the outbreak of the small-pox: Falkner, p. 117; Barrere, Beschr. von Guiana. Götting. Samml. v. Reisen, II. 159.

‡ Lettr. édif. Nouv. Ed. VIII. 339–345.

* Bosmann, S. 463 seq.

† Bastian, 78.

‡ Bastian, 88. *Cf.* Loyer, p. 152.

§ Halleur, S. 29.

bathing place, where the priest washes the neophytes and marks each with a white stripe. The ceremony concludes with shouting and singing."* Education, such as it is, is altogether controlled by the priests. "Every year the priests assemble the boys who are entering the state of puberty, and take them into the forest. There they settle, and form an independent commonwealth, under very strict regulations, however: and every offense against the rules is sternly punished. The wound given in circumcision commonly heals in one week, yet they remain in the woods for a period of six months, cut off from all intercourse with the outside world, and in the meanwhile each receives separate instruction how to prepare his medicine-bag. Forever after each one is mystically united with the fetich who presides over his life. Even their nearest relatives are not allowed to visit the boys in this retreat; and women are threatened with the severest punishment if they be only found in the neighborhood of a forest containing such a boy-colony. When the priest declares the season of probation at an end, the boys return home, and are welcomed back with great rejoicings."† The children are subjected completely to the power of the priests, and the latter appear sometimes to give this power a highly mystical expression. Bastian thus recounts what he heard in Quindilu from the lips of an interpreter:

"In the country of Ambamba each person must die once, and come to life again. Accordingly when a fetich-priest shakes his calabash at a village, those men and youths whose hour has come, fall into a state of death-like torpor, from which they recover usually in the course of three days. But if there is any one that the fetich loves, him he takes into the bush and buries in the fetich-house. Oftentimes he remains buried for a long series of years. When he comes to life again, he begins to eat and drink as before, but his reason is gone, and the fetichman is obliged to train him, and instruct him in the simplest bodily movements, like a little child. At first the stick is the only instrument of education, but gradually his senses come back to him, and he begins to speak. As soon as his education is finished the priest restores him to his parents. They seldom recognize their son, but accept the express assurance of the feticero, who also reminds them of events in the past. In Ambamba a man who has not passed through the process of dying and coming to life again is held in contempt, nor is he permitted to join in the dance."* Bastian adds that the Batheniers of the Sheikh Al-Gebal, in Bamba, are subjected to a similar course of treatment.

Nor are adults exempt from the power of the priest. When the fetich demands the consecration of persons to his service these may be chosen, as in Loango, in the following manner: In that kingdom "annually a stated number of men, women, and children, 12 years of age, are dedicated by the chief of the Gangas to the fetich Maramba. These then keep a fast for several days in a dark hut, and are then dismissed with the admonition to observe strict silence for eight days. Torture is employed to test their resolution: but if this fails, and they refuse to open their mouths, the Ganga conducts them to the presence of the idol, and there making a crescent-shaped incision on the shoulder, requires them to swear, by the blood which flows from the wound, that they will be ever true to Maramba. He forbids them the use of certain meats, imposes upon them certain vows, and hangs around their necks, as a token of their consecration, a little case containing relics."† Persons thus devoted to

* *Ib.* 30. *Cf.* Waitz, I. 365.
† Bastian, 85.

* Bastian, 82.
† *Ib.* 86.

the fetich are, according to Halleur, inviolable: "They may do what they please, and may take what they wish: it is death to refuse them anything." The only drawback is that every year a few of them are offered in sacrifice.*

The priests are the Sages. Their science expatiates over the entire field of fetichism and gives the rules for the preparation and application of fetiches; the formulas of incantation; the methods of performing juggling tricks; the doctrine of souls and spirits and the rites of worship. Finally, their science embraces a knowledge of history and of jurisprudence, as we have seen,—a difficult course of study for the dull brain of the savage, who strives dumbfounded to grasp the profound thoughts, and the lucid definitions of his Master. Thus, *e.g.* "the distinctions between Spirit and Soul; their relations with the body, their pre-existence and their future existence are as nicely defined, as the functions of the three Spiritus familiares in Cornelius Agrippa." † As is ever the case when the mind is constantly occupied in the contemplation of one object, the priest, who is ever engaged with his fetich, enlarges and develops the primitive conception of the thing. He originates a multitude of new fetiches, and proposes them for the veneration of the common people, who take them up greedily. He elaborates distinctions and definitions, classifications and systems: in his hands the popular belief assumes scientific shape. It cannot be uninteresting to study minutely this dogmatic theology of the savage: but we must not expect to find here anything like logical consequence; for the savage, even though he dogmatize, is still a savage, and consequently his most elaborate system will be simply no system. As was to be expected, the various systems of Africa and America differ very widely from one another. Of course also the adherents of the different schools do not reduce their controversies to a courtly war of words, as is our custom; they prefer to demonstrate their theses by hard knocks. Such debates are not infrequent, and many a skull is cracked in the heat of argument. Thus, during Cavazzi's stay in Congo, two schools of doctors, the Macusa-Matamba and the Ngulungu-Nbazi, were continually at war, because they adhered to two different systems of medication.* Similar disputes divided the doctors of the Abipones, as also the piaches (conjurers) of the Caribs.†

The common people, of course, know nothing of fetichistic science. The notions peculiar to that science are as little comprehended by them as the nice points of dogmatic theology are understood by the masses here. Hence the very terminology of the savage *savant* is unintelligible to the savage layman. The feticeros among the Negro tribes, as also the Angekoks of the Greenlanders are said to have a language peculiar to themselves, which is entirely, or in great part, unintelligible to lay folk.‡ Even our common people do not understand the language of the learned. The Dakota priests use a peculiar language; the words are those of the common language of their nation, but employed in a sense different from that commonly given to them. The chiefs also use this esoteric language, in order to keep the common folk out of their secrets.§ In New Zealand, Tahiti, Hawaii and

* Halleur, 32.

† Bastian, 83, *Aum.*

* *Cf.* Bastian, 202.

† Dobrizhofer, II. 84; Du Tertre, II. 386: S'il arrive, qu' une personne invite plusieurs Boyez (pioches) et qu'ils fassent venir chacun leur dieu, c'est pire que la diablerie de Chaumont: car ces diables s'entredisputent, et se disent mille injures, et même, au dire des Sauvages, s'entrebattent si rudement, etc.

‡ Römer, S. 80 ff.; Cranz, 273; H. Egede (Bishop of Greenland), Beschr. von Grönland, S. 122. *Cf.* Bastian, 153.

§ Rigg's Grammar and Dict. of the Dakota lang. Washington, 1852. *Cf.* Waitz.

Mangareva we find also a sacred language—the priests use this language, though they now understand it only imperfectly.*

To propagate the knowledge of fetich science, the priests are "usually attended by a number of disciples, who prepare the fetiches, and who expect to succeed their masters." "Women who have long been barren, or who have lost their children, are wont to dedicate to the service of the fetich the unborn fruit of the womb, and to present to the village priest the new-born babe. He exercises it, at an early age, in those wild dances with deafening drum-accompaniment, by means of which he is accustomed to gain the requisite degree of spiritual exaltation; and in later years he instructs his pupil in the art of understanding, whilst his frame is racked with convulsions, the inspirations of the demon, and of giving fitting responses to questions proposed." † The Shamans, too, have their disciples; and Negro priests receive fees for instruction in their magical arts.‡

This priestly science, which makes its possessors men of redoubtable power, is kept a secret among themselves. It is only for the Initiated. Having thus doctrines in common, and being attached to one system, the priests constitute a society apart, a fraternity; an order, whose secrets are known only to the initiated, and whose mysterious power inspires the uninitiated with fear and terror. Such secret associations of priests are found in the organized priestly classes of Cabende and Loango.§ "To the South of Congo, we find a complete fetich-system only in Bamba. The king of Bamba, who was once the generalissimo of the kingdom of Congo, now lives in an almost inaccessible mountain district, entirely isolated from Portuguese influence, and permits no foreigner to enter his banza. Here is found one of those systems of religious mystery which exercise so fearful an influence along the western coast from Cameroons as far as the Gambia." The central object in this system is the Grand Fetich, already mentioned, who lives in the heart of the bush, perfectly inaccessible to all, who "usually conceals the mysteries of his worship in some remote cavern, but who also reserves to himself some localities lying near the highway, so as to remind terrified wayfarers of his power as often as they see the tokens of his occupancy." * In America too similar mystic fraternities are found.

New members are admitted only after a noviceship and probation of from one to ten years. When the candidate has given evidence of his fitness for promotion, by his observance of protracted fasts, by the performance of the frantic dances, by the violence of his convulsive paroxysms, and by drinking tobacco-juice, he is advanced by due degrees to full membership. Among the Caribs, the disciples of the Piaches receive full consecration as priests only after they have attained the age of 30 or 35 years.

The brethren form an alliance for mutual protection and defense, and their fidelity to one another is assured by the fact that the apostate is pursued with unrelenting hate.† The Dakota Indians have similar associations, whose mysteries consist of dances known only to the initiated.‡

The barbarous style in which these mysteries are celebrated, and instruction conveyed to the candidates, may be seen from the account which Bastian gives of the Yagas: "So soon as the death of the Yaga at Cassange became known throughout the country, the people and the Maquitas gathered around his corpse, which was

* Thomson, Story of N. Zealand. Lond. 1859, I. 80; Chamisso, 46; Moerenhout, 273; Voy. aux îles du grand ocean. Par. 1837, I. 484. *Cf.* Waitz, V. 2, 226 ff.

† Bastian, 85, 100.

‡ Cavazzi, II. 220, I. 294.

§ Bastian, 81.

* *Ib.* 82, 50.

† *Vide* Carver, p. 272; Charlevoix, 363; Du Tertre, II. 367 seq.; Biet, III. IV. 386, 387; Lafiteau, I. 336–344.

‡ Keating, I. 283.

seated on a high throne, arrayed in the feather-ornaments proper to a prince, and holding in its hand the Rilunga. They begged him to name his successor. Amid the din of uproarious music, the spirit of the deceased entered into the representative of the family of the Tendallas, who was lineally descended from the brother of the founder of the kingdom, and, in the ecstasy of wild inspirations, guided his hand to select the Chosen One out of the entire assembly. At once all the priests surrounded the Yaga-elect, and carried him off into the gloomy recesses of a distant forest, into which a layman could penetrate only at the cost of his life. In the mean time Magnates attended to the funeral rites of the dead Yaga, and after breaking out a tooth, which was regarded as something holy, they immured the body together with two of the favorite wives of the deceased, in a sepulchre previously drenched with the blood of a boy and a girl. The new Yaga, while receiving instructions in the fearful mysteries of the Catondos, was obliged to witness dark deeds of murder, so that his heart would not shudder at the contact of death, and was taught the poisonous and medicinal properties of herbs. At the end of one year he entered upon his office. All workmen who understand anything of the builder's art assemble to erect for him a palace. But before the work can be commenced, blood must be shed, to give firmness to the foundation-stone, and the one who is chosen to be the victim has his eyes and mouth carefully bandaged, lest a look or a cry should excite the compassion of the Yaga—for the slightest emotion of human feeling would break the spell, and bring down upon his head the wrath of his forefathers. His breast is steeled against pity; the head as it is struck off, rolls into the stream, and the Yaga walks four times through the pool of blood which has flowed from the victim, and washes therein his feet and his whole person. He then plants his banner on the spot where his throne is to stand, and work on the palace begins. When it is completed, the new Yaga shows himself to the people, who receive him with loud cheering. On the evening of the third day the prince (Yaga) summons the magnates to his residence, and then takes place that banquet, of which we have already made mention, where by partaking in common of human flesh they are bound to one another by an inviolable fetich." *

Among the American Indians the religious mysteries of the various orders and secret associations of the priests are held in the highest veneration; but they lay most stress upon the art of conjuring spirits. Schoolcraft mentions three such associations, the Jossakeed, the Meda (Meday, Midé) and the Wabeno; the second of which is best known. "To the Meday belong individuals of different tribes and tongues: all are admitted without distinction to the assembly (of the order) provided they are acquainted with the Meday ritual.† The chief festival of the order is the Medawin, which, however, the Sioux keep in a manner slightly different from the Chippeways. The songs sung at this festival are preserved in symbolic pictures which form a secret written language. These writings can be deciphered only by the initiated, who are acquainted with the true signification of the pictures and who know the songs by heart, the symbols serving merely to suggest their general tenor. The right of membership in this association, which is granted even to young children, is conferred in a hut specially built for the purpose. On this occasion a priest makes an oration upon the goodness of the Great Spirit; then follows a procession of the members in a circle, with their medicine-bags, and the candidate receives in the face a puff of air from out of the bags. The power of the conjuring-

* Bastian, 150–154.

† Copway, Traditional Hist. of the Ojibway Nation. Lond. 1850, p. 168.

devil thus prostrates him as though he were dead: but another puff restores him. He then gets a medicine-bag of his own; with it is conferred on him the power of a Meday; and he at once puts his power to the test, touching others with the medicine-bag, which causes them to fall prostrate. When the candidate is a child he is set before each of the medicine-bags in turn, and he gets a new name in addition to his own, which he ever after bears as a member of the society." *

The power of these secret associations is so great that, like the Vehmgericht, their judgments and their penalties, which are ever executed with promptness and vigor, affect not alone their own members, but the people in general. They constitute an invisible police, that with its thousand eyes beholds every hidden thing, and in the face of which no man considers himself secure. The effectiveness of the police of Old Calabar, administered by the Egboords, has sometimes led European police-captains to seek admission into the lower grades; † for all, even slaves, may purchase admission, though the latter can enter only the inferior grades. On the great festival of Egbo, masked men go about the streets, armed with whips, drag offenders forth from their hiding-places and inflict punishment. On that day women are not permitted to quit their houses. The power of the order is felt along the Gold Coast and the Slave Coast.‡ The terror of the Vehmgericht of the Belli-Paaro was spread throughout the old kingdom of Quoja. Now members were adopted only every twenty-five years, to keep up the association. Those who were cited to appear before this tribunal appeared thickly veiled, for a fearful death awaited whosoever with unhallowed eyes looked on the spirits who surrounded him there. When after three years of novitiate (concerning which the most direful stories were current among the common people) the new adept was for the first time suffered to quit the gloomy forest and to see the light of the sun, he made himself known to the Masters of the Society as a Brother by executing the figures of the Belli dance. He then took the brotherhood's "oath of vengeance."

We cannot determine whether, or how far, the African Purra and Semo associations are of a religious nature. Waitz gives this description of them: "Among the Mandingoes, especially those in the region of Sherbro, the Veis, the Timmanis and other tribes, the Purra association takes a very important part in the administration of justice. The Purra is a secret society, the nature of which is still obscure: so much however is known, that it is a kind of secret police, a secret tribunal, punishing theft, witchcraft and other secret misdeeds. Its ministers go masked, and surprise and seize culprits by night. Naturally this occasions grave abuses, still no man durst make any resistance. The society requires absolute obedience from its members and is made up of warriors divided into sundry classes. If any one by chance comes to a knowledge of their secrets, he is adopted a member by a terrible ceremonial, and threatened with death, should he divulge anything. Two parallel lines tattooed on the body are the insignia of membership. The Purra has also been described as a common federal tribunal having jurisdiction over different nations, and whose judgment is invoked in case of quarrels. The Purra then acts as judge or as mediator, and taking sides with one or other of the parties, decides the quarrel. The Semo among the Susus appears to resemble the Purra, and to have a similar purpose. The Semo has a sacred language peculiar to itself. Though Caillie * has written a long account of this associa-

* Schoolcraft, V. 430 seqq.; Kohl, I. 59, II. 71; Waitz, III. 215.

† Bastian, 294.

‡ Holman, I. 392.

* Caillie, Journ. d'un Voy. a Tembuctou, etc. (1824–28), I. 228.

tion, still we know absolutely nothing of its true nature."* (Waitz, II. 135.)

6. *Fetichism among Non-Savages.*

The human mind, in its various stages of progress, must always exhibit phenomena answering to the degree of development to which it has attained. Even where a higher grade of intelligence generally prevails, still the lower grades will not be entirely excluded, for the whole community will not have reached the same degree of development, individuals differing from one another very widely in this respect. Even in civilized countries you will find those who are essentially no better than Bushmen or Negroes in point of mental culture, albeit in outward seeming they differ as widely from the savage as our world differs from that of the Bushman. The difference between the fetich-worshiper κατ' ἐξοχήν and the fetich-worshiper as he is found in civilized countries is just this: the former is simply, or at least primarily, a fetichist, but the latter is primarily something different, though secondarily he is a fetichist. He would be as thorough a fetichist as the other, were it not that he is something else besides a fetichist, and so his energies cannot all tend to fetichism. Our next chapter will treat of the fetichism which prevailed among our heathen forefathers.

Here are a few examples. Suppose a hunter has repeatedly met with extraordinary good-luck in the chase when he wore in his hat a conspicuously beautiful feather, and that, on a few occasions when the feather was wanting, he had no success at all. He will in the future, for luck, plant such a feather in his hat. Now the hunter will have his faith in the potency of his fetich increased in proportion as his assurance of good luck, which he gets from the sight of the feather and his conviction of its efficacy, increases his confidence in himself, and so adds to his dexterity: *possunt, quia posse videntur.* Some people take an umbrella with them, *so that it may not rain.* In short we need but run over the list of our popular superstitions, in order to see how far the fetichistic apprehension of objects still endures amongst us. Thus, for instance, on every page of the Appendix to Grimm's "Mythologie" we meet with fetichism displaying all its characteristic features. I select only the following instances:

Useful fetiches: "If a man finds a horseshoe, or a piece of one, he is in luck.* He who takes in a large sum of money must mix with it a quantity of chalk, and then wicked people cannot take it back. (The fetich as caretaker.†) If a man eats a raw egg on Christmas morning, he will be able to carry heavy loads. Swallows' nests and crickets bring good luck to a house. If one finds a treasure, he must not cover it over with any garment used to cover the body, or he is a dead man: he must cover it with a pocket handkerchief, or with a crust of bread. Chase a hen thrice around a table, and mix with her food fragments of wood from three corners of a table, and she will stay at home. Fetich-medicine: Rain water will make children speak at an early age. A pulled tooth is to be driven into a

* Winterbottom, 180 seqq.; Golberry, R. durch das W. Afr. (1803) I. 56; Laing, 88 seqq.; Forbes, Six Months in Sierra Leone (Ger. Tr.) S. 84. *Cf.* Cæsar, B. G. VI. 13, 14: Fere de omnibus controversiis publicis privatisque constituunt; et si quod est admissum facinus, si cædes facta; si de hereditate, de finibus controversia, iidem concernunt, præmia pœnasque constituunt. . . . Hi certo anni tempore in finibus Carnutum, qui regio totius Galliæ media habetur, considunt in loco consecrato: huc omnes undique, qui controversias habent, conveniunt, eorumque decretis judiciisque parent. Si quis aut privatus aut publicus eorum decreto non steterit, sacrificiis interdicunt. Hæc pœna apud eos est gravissima. . . . Druides a bello abesse consueverunt, neque tributa una cum reliquis pendunt; militiæ vocationum omniumque rerum habent immunitatem. These Druids were also soothsayers, physicians, conjurers, etc. *Cf.* Tacitus Ann. XIV. 30; Hist. IV. 54; Germ. 7, 11; Plin. Hist. Natur. XXX. 4.

* Grimm, D. M. Anhang. Nr. 129.
† *Ib.* Nr. 5.

young tree, and covered with the bark. If the tree be cut down, the ache comes back. If you break a twig off a willow, and drive it into the aching tooth until the blood comes, and then restore the twig to its place, drawing the bark over it, the toothache goes away. The head of a mouse, bitten off from the body, or cut off with a knife of gold, assists a child in teething, when it is hung about his neck. If one is troubled with catarrh, let him drink a glass of water with a three-pronged fork. To cure debility in children: their urine is to be caught in a new pot: into this is to be put the egg of a coal-black hen bought without chaffering: the egg to be pierced with nine holes: the pot, wrapped in a linen cloth, to be buried after sunset, in an ant-hill that has been discovered without search. If any one afterward find the pot, he must not make any use of it, else he will take the complaint that was buried. Maleficent fetiches: It is unlucky to walk over *sweepings*. Fetich oracles: the grave-digger's mattock rattles when a new grave is to be dug. Charms and counter-charms: If one goes out of doors unwashed, he is easily bewitched. Never throw into the street hair that has come out in combing, or you will be always in danger from witchcraft. Old women often cut out a sod a foot long that has just been trod by their enemy: this they hang up in the chimney, and so cause their enemy to pine away. The whirlwind is caused by witches: throw a knife into the whirl and you will see them at work. Witches can produce rain and thunder: they can also raise winds to carry off linen that is bleaching, and hay that is curing in the sun. In the springtime when the cattle are first driven afield, axes, hatchets, saws and other iron implements are placed before the door of the barn; thus the cattle are guarded against witchcraft. When water is bewitched, and will not boil, place under the pot three sticks of different kinds of wood. A shirt spun by a girl of five to seven years of age is a sure protection against witchcraft. If your beast has been bewitched, go to the stable at midnight, and you will find on its back a straw: put the straw in a sack, call in the neighbors and give the sack a thrashing; the sack will then be seen to swell and the witch will utter a shriek. Our ancestors did not compare very favorably with savages: their treatment of witches was more cruel than the ferocity of any savages toward their conjurers; and the blazing fires of the Christian middle ages, lighted for the torturing of witches, were supposed to be the ministers of a Holy Spirit. Such blasphemy as this cannot be imputed to the savage. When we call to mind the rude and undeveloped state of intellect in which fetichism takes its rise, what a fearful light is thrown by these medieval phenomena upon the intellectual status of our forefathers, whom it is still, in some quarters, the fashion to praise and to admire! Shall I recount the pitiable absurdities, the gossip of the dairy and of the spinning-room, which were held by judges who pored day and night over their musty folios evidence sufficient to justify them in tearing away from the bosom of their families, in torturing and putting to death with every circumstance of cruelty, weak old women, idiots and children? Need I recite the frantic harangues which called for the kindling of fires in the market-places of university-towns, and which occasioned the death of hundreds of thousands of innocent victims? As late as the year 1783 the portentous gleam of these fires was to be seen in Germany."* And who is to assure us of their final extinction; and that there are not beneath the ashes concealed fires, still living and full of danger, which may burst forth in flames afresh, carrying desolation throughout the land? For we still have mighty fetiches, and these act in Europe precisely as they do in Africa.

Plutarch relates that the Dictator

* Bastian, 93.

Sulla had no such faith in any god, as in a little image of Apollo which he constantly wore upon his breast. Suetonius says that Nero was Religionum usquequaque contemtor, præter unius deæ Syriæ. Hanc mox ita sprevit, ut urina contaminaret, alia superstitione captus, in qua sola pertinacissime hæsit. Siquidem icunculam puellarem, cum quasi remedium insidiarum a plebeio quodam et ignoto muneri accepisset, detecta confestim conjuratione, pro summo Numine trinisque in die sacrificiis colere perseveravit: volebatque credi monitione ejus futura prænoscere.*

The amulet differs from the fetich in this, that here the sensible object is not regarded as possessed of a power of its own (for then it would be a fetich), but only as the representative symbol of some higher power, which is the real efficient cause. The amulet therefore points back to a train of ideas which lie behind it: the fetich stands upon its own merits. Thus, for instance, in the Arab's amulet—a verse from the Koran on a strip of parchment—it is not the parchment and the ink that produce the effect he desires, but the omnipotence of Allah, of which the writing is regarded as the sensible sign. But yet the people, who wear such amulets as a protection against the powers of evil, very readily forget this distinction, confound the two things, and regard the sensible object as the efficient cause. Thus the amulet becomes a fetich. The Mohammedans of Senegambia write the potent verse on a tablet, then they wash off the inscription, and drink the water.† Thus again, so soon as the working of miracles is associated with the image of a saint, that image of necessity becomes a fetich; and will receive from its worshipers precisely the same usage, which other fetiches receive at the hands of savage devotees. In mediæval times it was no uncommon thing for people, when a saint withheld his assistance in time of need, to renounce his service, to break his image in pieces, or to cast it into a river or a swamp.* As late as the middle of the 17th century some Portuguese sailors pronounced dire threats against St. Antony of Padua during a calm: they would have bound him hand and foot, were it not that some one came to his assistance. At length they set his image on the tip of the bowsprit and thus addressed it, kneeling: "S. Antony, be so good as to stand there ever till you give us a favorable wind, to continue our voyage."† A Spanish ship's captain fastened a little image of the Virgin to the mast, saying she should remain in that position until he got from her a favorable wind.‡ The Neapolitans once called S. Gennaro *vecchio ladrone, birbone, scelerato,* because he had not checked a stream of lava. They even cudgeled the saint.§ Some Spanish peasants, during a protracted drought, threw the Virgin into a pond, and called her witch, wench, etc.‖ When Russian peasants would do anything unbecoming in the presence of the saints' pictures, they cover the latter with cloths, to prevent their witnessing the deed.¶ A Russian peasant, who had harvested a poorer crop than his neighbor, borrowed from the latter his holy image, and mounted it on his plow, expecting thus to have better luck.** To this day Russian peasants whip saints' images; to this day images of the Virgin are put in prison by Italian peasants, precisely as the Negro does with his fetiches, when he would punish them, or keep them from harming him.††

* Suet. Nero, c. 56.
† Bastian, 197; Waitz, II. 187.

* Meiners, I. 181.
† Della Valle, Voy. VII. 409; Meiners *ub. supr.*
‡ Frezier, Rel. du Voy. de la Mer du Sud, p. 248.
§ Kotzebue, Reise nach Rom. I. 327.
‖ Spanien, Wie es ist. 1797, II. 117.
¶ J. J. Straussen's Reisen, Amst. 1678, S. 84.
** Weber, Verändertes Russland, 1721, II. 198.
†† Waitz, II. 185.

CHAPTER V.

THE VARIOUS OBJECTS OF FETICH-WORSHIP.

ANYTHING may become a fetich. An intelligent Dakota once said that "there is nothing that the Indians do not worship as a God."* For the Negroes of the Gold Coast, *Wongs* (objects of worship) are, first, the gods dwelling betwixt heaven and earth, who beget children, die, and come to life again. These deities are divided into distinct classes, which get their names from the functions they discharge, and these names are taken from the vocabulary of Negro state-craft. But then Wong is also, 1, the sea, with all its contents; 2, rivers, lakes, fountains; 3, certain enclosed areas of land, and all termite-hills; 4, the otutu (a little heap of earth raised over a buried sacrifice) and the drums belonging to a quarter of a town; 5, certain trees; 6, certain animals—the crocodile, ape, serpent, etc., while other animals are only sacred to the Wongs; 7, images carved and blessed by the fetichman; 8, certain combinations of cords, hairs, bones, etc.†

1. *Stones as Fetiches.*

All Nature is endowed with life: the savage mind apprehends even stones anthropopathically. The Lapps transfer to stones the domestic relations of Father, Mother and Child: they even fancy that stones roam about at night, after the manner of the "Roving Bell."‡ It is not only in Ovid's Metamorphoses that men are changed into stones; the natives of the Marianne Isles have a belief that the first Man was metamorphosed into a rock, which is still pointed out as an object of veneration.§ The worship of stones is to be found in all quarters of the globe; but in Africa it prevails most among the Gallas.* Men swear by stones and by rocks; for instance, the Somali in Africa,† not to speak of other nations. The ancient Germans and Gauls, as also the Celts, who, according to Grimm, were stone-worshipers *par excellence*, did the same.‡ Nulius Christianus ad fana aut ad petras, vel ad fontes, vel ad arbores luminaria faciat, aut vota reddere præsumat,—such is the exhortation given by S. Eloy in a sermon.§ The church in the middle ages never tires of condemning the "votum vovere ad lapidem, vel ad quamlibet rem." ‖ Offerings were made to stones by anointing them with oil, blood or wine.¶

The pagan inhabitants of Canaan worshiped stones in this manner.** De Brosses, in his work in the Bætylia shows that all the great nations of antiquity, not excepting the Greeks and Romans, worshiped stones. The inhabitants of Pharæ worshiped 30 square stones. *Τούτους σέβουσιν οἱ Φαρεῖς*, writes Pausanias, *ἑκάστου θεοῦ τινος ὄνομα ἐπιλέγοντες. Τὰ δὲ ἔτι παλαιότερα καὶ τοῖς πᾶσιν Ἕλλησι, τιμὰς θεῶν ἀντὶ ἀγαλμάτων εἶχον ἀργοὶ λίθοι.*†† In a higher state of intellectual development, when the notion of gods gained the ascendency, it was very easy to establish relation between some god and a stone, which previously had been worshiped on its own account. The Sacred Treasure of Jupiter at Tegea was a rough quadrangular stone. Meteoric stones were a special object of worship, being often regarded as incarnate rays of

* Waitz, III. 191.

† Bas, Missionary Magazine, 1856, II. 131; Waitz, II. 183.

‡ Requard, Voy. en Lappland, in Voy. au N. VI. p. 321.

§ Le Gobien, Hist. des Isles Marian[illegible]. Paris, 1700, p. 197.

* Rochet d'Héricourt, Voy. dans le roy. de Choa. Par. 1841, p. 167.

† Burton, First Footsteps in E. Afr. Lond. 1856, p. 113.

‡ J. Grimm, D. M. S. 370.

§ Vita Eligii by Andoenus Rotomagensis (d. 683 or 689), pub. by Achery, Spicileg, t. v. Paris, 1661, p. 215–219; Grimm, D. M. Anh. S. XXX.

‖ Grimm, D. M. Anh. S. XXXIII. XXXIV. XXXV.

¶ Meiners, Gesch. d. R. S. 150; De Brosses, Les Pierres Bætyles, 110, 123, 133, 135.

** *Cf.* Merx, s. v. Abgötterei, in Schenkel's Bibellexikon.

†† Pausan. VII. 22, VI. 22.

the sun.* Such ἀγάλματα διϋπετῆ (Bætylia, abadir) are the Stone Symbol of Diana, at Ephesus; of the Sun-God Elagabal, at Emissa, in Syria; of Mars, at Rome, and the Black Stone, the Kaaba, at Mecca.

Many savages regard stones as the children of Mother Earth,† for they have also an anthropopathic conception of the earth, and so worship her. According to Dapper, the King of Alé and his grandees used to hold council together, previous to a war, in a pit dug in the midst of the forest. The deliberations at an end, the pit was carefully filled up again, lest it should betray their secrets. The Iroquois and other Indian tribes believed themselves to be the children of Earth: they would never sit upon the bare ground, but always first covered the spot on which they sat, with a little grass, or with a branch of a tree.‡

Nam neque de cœlo cecidisse animalia possunt
Nec terrestria de salsis exisse lacunis:
Linquitur, ut merito maternum nomen adepta
Terra sit, e terra quoniam sunt cuncta creata.
Lucretius de R. N. v. 793 seqq.

2. *Mountains as Fetiches.*

Mountains are for many reasons objects of fetichistic worship. At one moment their summits are veiled in clouds, the next they are radiant in the fierce blaze of the sun; out of their caverns the winds issue forth, and down their sides are poured the torrents which fall from the rain-clouds enveloping their heads. All these phenomena are regarded by the untutored mind of the savage as produced by the agency of the mountain itself, and he accordingly pictures to himself the latter as endowed with a human will, and acting from human motives. In this respect he is a poet. He does not imagine any such thing as a Spirit of the mountain, a being merely inhabiting it; no, it is the Mountain itself, this tellurian mass that he worships. It is true, the fetichist sees in it something more than a heap of earth and rock. For him the mountain forms the clouds, and sends the storms. But why? From such motives as move men to action: now he is terribly wrathful; anon he is all smiles. So his worshipers will study to appease him, and for this purpose will make offerings to him.

The worship of mountains is found among several Siberian tribes, among Negroes and American Indians.* The Ural was worshiped by the nations dwelling around it. We must distinguish between this fetich worship and that respect paid to mountains, on the ground of their having once been the seat of a certain cultus, or the home of some god. In that case it is not the mountain but the god that is worshiped: and of this kind of veneration we do not treat here. As Jacob Grimm did not study fetichism in its psychological aspects, he doubted whether men ever could pay adoration to a mountain, and discredited all accounts which state that such a worship exists. I extract from his Deutsche Mythologie the passages which have a bearing on this subject, as so many proofs for the reality of Mountain-fetich worship.† "Many were the Sacred Mounts and Hills: but yet they do not appear to have been worshiped directly, but to have been venerated merely on account of the god who inhabited them (Wotan's and Donner's Berge). Though Agathias speaks of λόφοι and φάραγγες (hills and ravines) as being objects of worship, without any mention of any other object, we may suppose that he was an inaccurate observer, and that he failed to notice a worship of water or of fire having its sanctuary on the mountains. We might look for the worship of mountains among

* Bastian, Die Seele, u. s. w. S. 9.
† *Ibidem.*
‡ Tanner, Mémoires trad. pas E. de Blosseville. Paris, 1835, I. 250; Waitz, III. 184.

* The Yakutes, Sarytschew, I. 27; the Burats, Georgi, 318; Negroes, De Bry, VI. 21, Römer, 65; Peruvians, Acosta, 206; Mongolians, Isbrand, p. 111.
† Deutsche Mythol. S. 369.

the Goths, in whose language *fairguai* signifies *mountain*, if the explanation we have already * given of this word is correct. Dietmar of Merseburg gives an example of Sclavic mountain-worship (p. 237): Posita est autem hæc (civitas, i. e. Nemzi, Nimptsch) in pago Silensi, vocabulo hoc a *quodam monte*, nimis excelso et grandi, olim sibi indito: et hic *ob qualitatem suam et quantitatem*, cum execranda gentilitas ibi veneraretur, *ab incolis omnibus nimis honorabatur*. The commentators are of opinion that this mountain is the Zobtenberg."

3. *Water as a Fetich.*

Jacob Grimm gives a very full account of the worship paid to Water in the spring, the brook, the river, and the sea, and describes the religious observances of the people, as they "offered their prayers, lighted lamps, or made their sacrifices on the banks of the stream, or on the margin of the spring;" and these usages he traces from the remotest antiquity down into the Christian era.† "The pure, flowing, bubbling, evanescent water; the flaming, glowing, dying fire; the air, perceptible, not to the eye, but to the ear and to the touch; the Earth, which maintains all things and to which they all revert: these have ever been regarded by man as sacred and worshipful, and through them he has been wont to bestow a solemn consecration upon the customs, the pursuits and the events of his life. Their action upon the entire universe being steady and constant, the untutored mind pays them worship for their own sake without any reference to a deity residing in them." The anthropopathic apprehension of rivers, springs, and the sea is found among all savage nations. Many of the populations on the banks of the Niger regard its tributaries as the wives of the main stream.‡ In Acra a pitcher used to be cast into a pond which was thought to be the messenger of all the rivers in that country: the pond was then entreated to go abroad with the pitcher and purchase water of other ponds and streams: on returning home it was expected to bring sufficient water to irrigate all the fields.* The spring is regarded as the seat of all the river's life. Strangers must not come near it.† The Negro savage believes that the presence of the white traveler may enrage the River Spirit, or do him hurt, or even deprive him of life. Rivers are an object of worship not only in Africa,‡ but also in America § and in Northern Asia.‖ Whenever the Kamtchatdales sail across a dangerous whirlpool they cast into the water little pieces of wood neatly carved, and tobacco, and excuse their temerity by saying: "Be not angry with us for sailing over thee, as though we had forgotten our reverence for thee. We are not without reverence, but the Russians oblige us against our will to make this navigation." ¶ The ancient Russians worshiped the Don, the Dnieper (worshiped as the Borysthenes by the Scythians) and the Wolga—streams on which they depended for their existence. The ancient Mongolians would appear also to have been given to river-worship.** According to Agathias the Alamanni too worshiped rivers: *Δένδρα τε γάρ τινα ἱλάσκονται καὶ ῥεῖθρα ποταμῶν καὶ λόφους καὶ φάραγγας, καὶ τούτους ὥσπερ ὅσια δρῶντες.*†† Herodotus makes a similar statement as to the Persians:

* Deutsche Mythol. 116.

† D. M. 326–340.

‡ Clapperton, Tageb. seiner, zweiten R. p. 414.

* Allg. Gesch. der R. IV. 180; Waitz, Anthr. II. 177.

† Laing, p. 310; Bastian, 59 f. "In 1641 Hans Ohm of Sommerpahl built a mill over the brook: and as the succeeding year proved disastrous to the crops, everybody assigned as the cause, the profanation of the sacred brook, which was indignant at having been checked in its course. So they attacked the mill, and utterly destroyed it." Grimm, D. M. 338.

‡ Cavazzi, I. 363.

§ Charlevoix, p. 348.

‖ Georgi, Reise, S. 318; Steller, S. 21.

¶ Steller, S. 19.

** Wuttke, I. 214. *Cf.* Barrow, Trav. in China. Lond. 1804, p. 509.

†† Agath. 28. 4.

Ες ποταμὸν δὲ οὔτε ἐνουρέουσι οὔτε ἐμπτύουσι, οὐ χεῖρας ἐναπονίζονται, οὐδὲ ἄλλον οὐδένα περιορέουσι, ἀλλὰ σέβονται ποταμοὺς μάλιστα. * Seneca says of the Romans: Magnorum fluminum capita veneramur: subita et ex abdito vasti amnis eruptio aras habet. Coluntur aquarum calentium fontes: et stagna quædam vel opacitas vel immensa altitudo sacravit.† The honor which the Hindus pay to the Ganges does not belong to this category. The Hindu apotheosis of Nature is pantheistic, not fetichistic. "O Mother Earth, Father Air, Friend Fire, Brother Water, I now in all reverence and for the last time address my prayers to you: I am about to enter into the Supreme Brahman, for owing to the surplus of good works which I have laid up during my intercourse with you, I have attained to immaculate knowledge and have so cast aside all power of straying from the Truth." ‡ We must however here remember that in the hands of the common people the amulet easily becomes a fetich.

The natives of Sumatra and of the Philippines worship the sea, as well as those of Africa. By the ancient Peruvians, before the time of the Incas, the sea was regarded as the supreme deity.§

The Kaffirs make offerings to a stream, of entrails, animals and millet, to secure immunity against disease.‖ Roman naval commanders offered sacrifice to the sea before setting sail.¶ Even in the last century Christian Greeks made offerings to rivers; and Turks regarded it as perfectly natural to throw overboard Christians and Jews, in a storm, to appease the wrath of the sea.** A tempest having broken up the first bridge of boats, Xerxes ordered three hundred lashes to be given to the Hellespont, and chains to be cast into it. Again he presented an offering on a dish of gold, and this, together with a golden goblet, he threw into the waters of the strait. Herodotus is undecided whether this was done in honor of the Sun, or to appease the offended Hellespont.*

4. *Wind and Fire as Fetiches.*

"The hurricane (called by the Congo Negroes, 'the Horse of the Boonzie') is regarded as a ravening, devouring monster—a giant like the Jötunns—whose wrath may be appeased by casting meal into the air. I regard this," says Jacob Grimm, "as a primitive superstition." † "In the popular traditions of Russia the four winds are the sons of one mother, and in the ancient Russian song of Igor the Winds are addressed as Lords, and are said to be the grandsons of Stribog, whose divine nature is implied in his name. In like manner in Oriental tales and poems the wind is represented as speaking and holding converse." ‡ Of the Payaguas of S. America Azara § says: "When a storm overturns their huts or casas, they take a brand from the fire, and run against the wind for some distance, threatening it with the brand. Others strike terror into the storm, by pummeling the air soundly." In Asia the Tcheremis used to make offerings to the winds.‖ In ancient times the same custom was in vogue among the Greeks and Romans, as well as other nations.¶

In every quarter of the globe we meet with the worship of Fire, that "mysterious element, ever restless,

* Herod. I. 138.

† Senec. Ep. 41; Cic. de N. Deor. III. 20.

‡ Otto Böhtlingk, Indische Sprüche, B. II. S. 97 (1 Aufl.).

§ Bosmann, S. 168; Atkins, Voy. to Guinea, Brazil and the W. Indies. Lond. 1737, p. 119; Snellgrave, Nouvelle Relation de la Guinée. Amst. 1735, p. 69; Marsden, 256, 258.

‖ Alberti, S. 72.

¶ Cicero, de N. Deor. III. 20.

** Shaw, Travels, or observations relating to sev. parts of Barbary and the Levant. Lond. 1757, p. 333; Guys, Voy. littéraire de la Grèce. Par. 1776, I. 466; Kleemann, Reisen in die Crimm. II. Wien, 1771, S. 113.

* Herod. VII. 34, 35, 54.

† D. M. 363. *Cf.* S. 360–368.

‡ D. M. 361.

§ Azara, II. 137.

‖ Rytschkow, S. 86.

¶ Herod. VII. 178, 189; Pausan. II. 12; Cic. de. N. Deor. III. 20.

ever consuming, ever brightly flaming Power of Nature." "Our Northern student lights his lamp with a match, spreads out before him the volumes written in the past, and traces in Hephæstus the root Phtha, or compares Vesta, Behram and Agni with one another. As I take it, this is commencing at the end and not at the beginning. The student does not consider that friction-matches are a very recent invention, and that anciently the production of fire was a very difficult process: as we may still see in the case of savages who often spend hours in getting fire.* The *lucifer* which has become for us a thing so familiar that we never stop to think about it, was once one of the most mysterious of wonders, a wonder which must have all the more forcibly impressed men's imaginations, inasmuch as it not alone promoted man's comfort, but even made life endurable, especially in cold climates. Hence we can understand why the Sacred Fire always burned in the shrine; why faithful guardians were appointed to care for it, and why this worship of Fire was recognized in public legislation, as well as in the concernments of private life." † "Fire, like water, is regarded as a thing of life;" ‡ and by many savage tribes it is held to be an animal. Τὸ πῦρ θηρίον ἔμψυχον, says Herodotus, describing the beliefs of the Egyptians (III. 16), and Cicero has, ignis animal. (De N. Deor. 3. 14.) Among the Damara, one of the rudest of savage tribes, who can scarcely count beyond the number three, and to whom the institution of marriage is unknown, the daughters of the chiefs are charged with the duty of keeping up the Sacred Fire, for Vestals are to be found in several religious systems, the duty of keeping up a sacred fire being an easy one, and best suited for women. When a family separated from the tribe and emigrated they took with them a brand of the sacred fire. Whenever the fire went out, on rekindling it, sacrifice was offered.* The Sioux called themselves Potowatomie, which means, we make fire,† and, like the Ojibways and other nations, they kept up an undying fire, as the symbol of their nationality.‡ According to Adair the word Cherokee is derived from Cheera, fire. The Muscogees gave to fire the highest Indian title of honor, *grandfather;* § and their priests were called "Fire-makers." The chief ceremony of their principal festival, "the First Fruits," was the Renewing of the Fire, a performance which, among the Mexicans, was repeated every 52 years. The old fires were then all extinguished, and it was only after they had practiced purificatory rites and fasted for the space of three days that the people supposed they had received the consecration which was needed for the kindling of the new Fire.‖

With the worship of fire that of Lightning and Thunder is closely allied. Perhaps among all the phenomena of Nature the worship of Thunder and Lightning is the most widely diffused. It is found among the rudest populations—the aborigines of Brazil, for instance.¶ The Betchuana worship the rain as it falls from the clouds. As their country is arid and barren, and their great curse drought, they hold Rain to be the Giver of all good. They begin and end every solemn discourse with the word *Puhla*, rain, and they have the greatest veneration for their Rain-makers.** In some countries it is not the Rain itself but a Rain-giver that is worshiped; not the Thunder, but a Thunderer, who ranks above all other spirits by reason of the dread power of his voice and the awful, death-dealing force of his shaft, the Lightning.

* *Cf.* Grimm, D. M 341 ff.
† Bastian, 343.
‡ D. M. S. 340.

* Anderson, Reise in S. W. Afrika bis zum Ngami. Leipz. 1858, I. 239.
† Keating, I. 89.
‡ Schoolcraft, II. 138.
§ Waitz, III. 208.
‖ *Ibid.* 208.
¶ M. v. Neuwied, S. 144.
** Thompson, I. 180; Campbell, 2d Journey, 230

The Damara regard as their supreme deity Omakuru, the Rain-giver, who dwells in the distant North.* Some of the Damara even claim for themselves descent from the Rain, while others would have only birds, fishes and worms reckoned as Rain's progeny.† In the island of Ponapi the supreme Being vents his wrath in the thunder: ‡ and in the northern Sagas Lightning is called God's *Beard-speech*, for when Thor mutters words behind his red beard, the lightnings flash through the sky. Zeus shakes his ambrosial locks, and the heavens are moved. In the isle of Morileu navigators adored the rainbow, or perhaps the spirit of the rainbow.§

After the mind has attained some degree of development, the old objects of worship still remain, but they are then subordinated to the new, and pass for the symbols of the latter. As Zeus was thus connected with lightning and thunder, so among the Israelites Jehovah was connected with fire, as his appearance in the Burning Bush, in thunder and lightning on Sinai, and in the Pillar of Fire, clearly shows. Vulcan came into relation with the sacred fire of Vesta through the column of flame which shot up from Etna.

5. *Plants as Fetiches.*

"Heathendom regarded all Nature as living," says Jacob Grimm.‖ This view of Nature is very clearly expressed in the northern myth of Baldr. To ward off from the beloved God all danger, Frigg exacted an oath from Earth, from stones, water, fire, plants, beasts, birds, worms, and even from Pestilence, not to injure him. Only the young and and tender Mistletoe was by the goddess thought so weak and powerless that she did not require of it the oath. But when afterward Hödur, at the prompting of Loke, with this plant compassed the death of Baldr, all creatures wept—plants, beasts and men.

If inanimate stones are regarded as living beings, we are not to be surprised if plants are also thought to have souls, for their whole process of development, in growing and blooming, in bearing fruit and in withering, has many analogies in human life. This anthropopathic apprehension of plants is very evident in the belief entertained in popular superstition as to the powers of the magical plant Mandrake, which is mentioned under the name *μανδραγόρας* by Hippocrates, Xenophon, Plato, Theophrastus and others. It is described as shaped like a man. When it is plucked from the earth it utters a cry, a groan of pain so terrible as to cause the death of the one who plucks it out. But if it be displaced by a special manipulation of the surrounding earth, it must be then washed in red wine, wrapped in white and red bandages of silk, bathed every Friday, and vested in a fresh, white garment at each new moon. If questioned it will make known future and hidden things tending to the welfare and prosperity of the questioner, and if a piece of gold lies beside it through the night there will be found in the morning two: but its good-nature must not be imposed upon, however. The water in which it has been washed is to be poured upon the door-sill, or upon the cattle, and so the house and the stock are preserved from ill-luck. If barren women drink of it, they will be blessed with progeny. If a man wears the mandrake about his person he will always in suits at law defeat his opponent.*

This mandrake is of human origin,

* Anderson, I. 237.

† Rh. Missionsber, 1852, S. 235; Hahn, Grundzüge einer Grammatik des Herero. Berl. 1857, S. 152.

‡ Michelewa y Rojas, Viajes cientificos en todo el Mundo (1822–42). Madrid, 1843, p. 197.

§ V. Kittlitz, Denkwürdigk. auf einer R. n. d. russ. Am., Mikrones. und Kamtsch. (1826 ff). Gotha, 1858, II. 105.

‖ D. M., S. 371.

* Meiners, II. 600.

springing from a chaste youth's semen fallen to the ground. But on the other hand, men also spring from plants. There is a Micronesian story to the effect that Tangaloa's daughter, while yet the earth was parched and barren, assuming the form of a snipe alighted upon the earth, and made her home on a rock. From the rock a creeping plant sprung forth, and as this died away it produced at first worms, then men.* Some of the Damara tell of the descent of man and the larger beasts from a sacred tree, which they worship. In the German Song of Alexander (Alexanderlied) by Pfaff Lamprecht, "megede rehte vollencommen"—perfectly beauteous maidens—are spoken of as springing from flowers.

> "Si giengen unde lebeten
> Menschen sin si habeten."

As they spring from the flowers, with them they perish:

> "Die blûmen gare verturben
> Unde die scônen frowen sturben."

Daphne was changed into a bay-tree.

In speaking of the worship of plants, trees and woods, I do not give it Ovid's interpretation:

> Stat vetus et multos incædua silva per annos,
> Credibile est *illi numen inesse loco.*†

On the Coral Islands of Polynesia the *crinum* and the *dragon's blood* are held sacred. The Dayaks of Borneo worship also the *dragon's blood*, together with the *pancratium amboinense.*‡ Generally, however, it is large trees that are worshiped, such as the mighty *adansonia.* In Whidah the sick apply to the sacred trees, for the cure of their complaints.§ On the Zaire the public and the domestic council of the prince meet beneath the holy *ficus religiosa,** a tree which plays an important part in the history of religion. In Congo it is planted in all the market-places, as an object of worship: its bark has fetich-craft; and any injury done to the tree is punished as a crime. The Somali worship certain trees,† and the Galla specially the wanzey-tree, though in the south of Shoa they regard the *wodanabe*-tree as their national Palladium, their "great Fetich." ‡ This same tree-worship is found in N. America and Northern Asia, for instance, among the Ostiaks, Wotiaks and the Tsheremis.§ The savages of Acadie worshiped an ancient tree on the sea-shore. This tree having fallen root and branch into the sea, they continued to worship it as long as any part of it remained visible.‖ The sacred tree of the Longobardi was the so-called blood-tree, and the ancient Germans worshiped chiefly the oak, though they had also great reverence for the alder: ¶ nor were the ancient Jews, Arabs ** or Persians †† without their fetich-trees. The goddess Ashera was originally worshiped under the form of a simple stock of wood.‡‡ "The Diana of the isle of Eubœa was a piece of unhewed wood, the Thespian Juno of Cytheron the trunk of a tree, she of Samos a simple slab of wood, as was also the Delian Latona; the Carian Diana was a cylinder of wood, and the Pallas, and the Ceres at Athens were rough stakes, sine effigie rudis palus, et informe lignum." §§

As single trees, so also whole groves, with their green, umbrageous aisles, their mystic gloom, and the tuneful rustling of their leaves would

* Turner, p. 244.
† Ovid, Amor. III. 1. 1.
‡ Gerland, in Waitz, V. 2. 10.
§ Bosmann, II. 64, 323, III. 153; Des Marchais, II. 132.

* Tuckey, p. 366.
† Waitz, II. 523.
‡ *Ib.* 518.
§ Rytschkow, S. 161.
‖ Charlevoix, p. 349.
¶ Grimm, D. M. S. 374.
** Merx, in Schenkel's Bibellex. Art. *Aschera* and *Astarte.*
†† Meiners, I. 152.
‡‡ Merx, *ubi supr.*
§§ De Brosses, p. 151.

make a most profound impression on the childlike fancy of the savage. The rustling of the leaves was regarded as the language of the trees: thus it was that the sacred oaks of Dodona spoke, and oracles were published founded on these words of the oaks. Athene, according to Apollodorus, fixed on the prow of the Argo a voiceful piece of wood from one of the Dodonian oaks (*φονῆεν φηγου τῆς Δωδωνίδος ξύλον*); and the wooden ships of the Phœacians were possessed of souls (*τετυσκόμεναι φρεσὶ νῆες*).*

Among the ancient Germans single trees as well as entire forests were held in the greatest reverence.† Such sacred groves were not to be entered by the profane: such sacred trees were not to be stripped of their leaves or branches, or to be hewed down. Compare sacrum nemus, nemus castum, in Tacitus, and Lucus erat longo numquam violatus ab ævo, in Lucan.‡ Amongst the sacred groves of German lands were the forest of the Semnones, the nemus of Nerthus, the Sclavic lucus Zutibure and the Prussian grove Romowe. Amongst the Esthonians it was held impious to break off a twig in a sacred grove, nor would they even pluck a strawberry within its shadow.§ Long after the introduction of Christianity the violation of trees was sternly punished in Germany.‖ Of the Esthonians at the present day we have this account: Only a few years ago, in the parish of Harjel, they *made offerings* (opferten) under certain trees on the nights of S. George's, S. John's and S. Michael's day. they killed a black hen. According to the superstitious belief of the Wends of Lausitz there are forests which annually demand a human sacrifice (as do many rivers) and one man must annually yield his life.¶ For an account of the ecclesiastical prohibitions, vota ad arbores facere aut ibi candelam sen quodlibet munus deferre, arborem colere, votum persolvere, consult Grimm, D. M. Anhang. XXXIII. XXXIV.

* Odyss. VIII. 556.
† *Cf.* Grimm, D. M. 371 ff.
‡ Pharsal. III. 399.
§ "Ut umbra pertingit." Grimm, R. A. 57, 105.
‖ Grimm, Weisthümer, III. S. 309, 18, IV. 366, 15, 699.
¶ Grimm, D. M. *ub. supr.*

6. *Animals as Fetiches.*

Christianity, that religion which sets the highest value upon the human individual, places a great abyss between man and nature. She isolates man and places him infinitely above nature. Christianity therefore regards the animal as in every respect far inferior to man. The religions of India regard Nature as only the outward aspect of Brahma; for them therefore the eternal Being is visible in the beast as well as in man. Consequently in the beast the Hindu recognizes a brother, of equal rights, and of like rank with himself. But the vtew which the savage takes of the animal world is different from both of these. He commonly regards the animal not simply as his equal, but as a superior being. Of the Negroes Waitz says: "In their view man has not his definitive place at the summit of Nature, and above the animals, but the latter appear to them as enigmatical beings whose nature is involved in obscurity and mystery, and whom they rank now as above themselves, again as beneath."* "The Indians," says the same author, "regard the animals as man's ancestors and kindred and ascribe to them a human understanding and human principles of action, or even sometimes a higher intelligence and superhuman capacities. Those animals, however, which neither inspire them with fear nor display any notable sagacity they despise." † To understand why the savage views the animal creation thus, we need but know the nature of his intellect and the conditions of life in which he is placed.

As the understanding reaches only as far as its objects, it will always be

* Anthrop. II. 177.
† Anthrop. III. 192.

enlarged as the number of these increases. The greater a man's intelligence, the wider is the line of distinction between him and beings possessed of none at all, or of a less degree than himself. But so long as the number of his objects does not exceed that possessed by animals; so long as they are the same in kind as those possessed by the animal, and not more numerous, in other words so long as his *world* is that of the animal; just so long the intellectual condition of the lowest savage will not be distinguishable from that of the beast.

The will can be exerted only upon the objects exhibited to it in the understanding. Hence, so long as these objects are no higher than those of the animal, the will of the savage cannot have any higher aims than has the will of the beast.

As we have already seen, the savage has a very small number of objects. From the lack of objects of a higher nature, we have shown that his will must be concentrated on those which are purely material. Hence his only stimulus, his only great interest is to satisfy his hunger, his lust, or his desire of repose.

Thus as regards his intellectual status and the range of his desires, the savage, even where he has made some little progress, differs but little from the animal, while at a lower stage he scarcely differs at all. The world of the animal is his world also, and their interests are the same. Hence there is hardly any difference between the savage and a highly-organized animal. But as he differs so little from them, it is impossible for him to regard himself as something quite distinct from them. His pursuits and those of the animal are identical; their wants, their motives are the same; the animal is the counterpart of the man; therefore the savage regards the animal as his equal, as his kindred.

Hence, for the simple reason that the savage and the animal are *de facto* scarcely distinguishable, they would be apprehended as standing on an equality. And as the savage cannot attribute to the beings around him any internal properties save those of which he already has consciousness, he is forced, as we have seen, to form anthropopathic apprehensions of objects. The more closely these beings resemble man in their nature and habits, the sooner will he attribute to them the self-same motives which excite himself. In fact his conduct differs very little from theirs; not alone does he closely resemble them; he is in many respects perfectly identical with them. Hence, as he must have anthropopathic apprehension of a mountain, a river, or a tree, he cannot help regarding the animal as of his kindred. In the eastern part of South Africa Monteiro's ass was a novelty to the natives, and they at once commenced to ask the donkey what he thought about things, always regarding the ass's doings as human performances.*

But not only must the savage regard all, or at least some animals as his equals, he will even assign them a superior rank. Intellectual qualities he values little, as he knows but little about them: but on the contrary, like all men of uncultured minds, like boys, like the old giants in the heroic legend, he prizes bodily strength above everything else. The great chief who with a blow can split the skull of his antagonist; whose powerful voice can be heard at enormous distances, whose nails are like the claws of a bear, who lays hold of a man and tears him in twain, who when hot coals fall upon his body in sleep, is not awakened, but treats them as gnats; who every day devours an entire sheep, and drinks a skin of fermented and distilled milk without being drunk: such is the savage's ideal of true greatness. But nowhere does he find such bodily strength and agility, such fiery courage and uncurbed fury as he does in wild beasts, the lion, tiger, wolf, bear,

* Zeitschrift f. allg. Erdkunde, VI. 407.

elephant, etc. They are the realization of what he might be himself: they are the ideals, the prototypes whose names he delights to assume, and which he chooses as his Totems, and his guardian spirits. They indeed are the mighty ones of his country: his weapons are often insufficient to protect him against their attack; he is at their mercy, and lives as it were by their favor. Then the colossal size of some of these beasts, or the majesty of their presence—the demon fascination of their gleaming eyes, must make on the savage a profounder impression than upon us, inasmuch as these are the very properties he is best acquainted with and which he values most highly.

Not only does this bodily strength inspire him with respect for the beast, as a being superior to himself; he attributes to him, furthermore, a higher degree of sagacity and circumspection. The unerring instinct of the animal: the cunning of the fox, the dog's acuteness of sense, the ingenuity of the beaver in constructing his house, of the bird in building its nest, of the bee in forming the comb: all this is in sharp contrast with the poverty and helplessness of man in the savage state. He knows nothing of the price the animals have to pay for the power they possess, nor reflects that they too do learn, and suffer anxiety and pain. Again the service rendered to him by several animals—as the ox, who with all his strengt his still so patient—disposes the savage to regard the beast as a being worthy of respect, and by no means as the pattern of stupidity.

This exposition of the relations between the savage and the brute which is based on the results of observation, is also confirmed on every side by observation. We find the best illustration of this in the Animal Legend (Thiersage), as it is found among our Germanic ancestors, "a form of composition which could have its origin only when men were in a very primitive state, and men and animals consorted together intimately and with a childlike ingenuousness." Vilmar's remarks on this subject are apposite:* "The root of this legend" (Reynard the Fox), says he, "lies in the guileless natural simplicity of primitive man; in the deep and kindly instincts of a sound and vigorous savage race. As they conceive a cordial and even passionate attachment for Nature in her varying phases; exulting with her in the mildness of the spring time and in the genial heat of summer, sharing the melancholy of autumn, and in winter giving themselves up to the torpor which reigns all around: as they attribute to these different phases of Nature an individuality like their own, with like emotions, and develop these conceptions in the form of grand myths, in which the creatures of imagination are represented now as kindly and gracious, again as awful and majestic, as they appear respectively in Siegfried and Brunhild: so, very naturally, they form a very close and affectionate attachment for the brute creation, their nearer neighbors and their closer kindred. Nay, more, they admit them to intimate association with themselves, as though they were truly and essentially, and not by adoption, or by imaginative fiction, members with themselves of one society. It is the pure, innocent delight which the savage takes in contemplating the brute creation—their lithe figure and flashing eye, their courage and ferocity, their cunning and agility; it is his knowledge of their habits derived from the daily experiences of a life lived in common with them that gave rise to these fables of animals, to the animal-epic. But such life-experience can be obtained by man, only when he studies the animal with a calm and affectionate interest; when he contemplates its inmost nature, its most recondite characteristics; when he not alone shares himself the nature of the animal, but also in turn gives to the animal a share in his own human faculties of thought and of speech,

* Vilmar, Literaturgeschichte, I. 244 ff. 8 Aufl.

and attributes to the animal's actions the same importance, the same intelligent direction, which he claims for his own. This mutual commerce of Brute and Man is the absolute condition of the Thiersage. The brute of the legend is not a mere brute, of nature quite diverse from man's, and having no psychic communion with him: but no more is it a man disguised in the form of a brute. In the former case, the brute could never be the object of poesy, or at least would not furnish the true material of poesy, *action*. In the latter case, such legends would be only tedious allegory. The charm of the legend lies precisely in this dark background where the brute and the man have so much in common; and on this background we must not suffer the lights of our better informed understanding to fall, else the very essence of the legend vanishes."

There is no form of poetry, as Meiners thinks, more agreeable to the uncultured mind than the fable; and in point of fact fables are extremely numerous among savages. Their ultimate basis is the anthropopathic apprehension of the brute creation, the dark background of which Vilmar speaks.* Lessing supposes the object of the fable is to give palpable shape to a moral truth. Even the Hottentots have a large collection of animal-fables, with the recital of which they amuse one another. The Negroes, too, "when they come together to smoke tobacco, or to quaff their palm-wine, entertain one another by telling fables, and they dress up every passing occurrence in the garb of legend or fable. 'The Spider,' to give one example, 'the Spider would lay out a plantation, and set to work about it vigorously without delay. But he had not got the ground ready, when the seeding-time was gone by: and the same thing occurred year after year. The Termite who would build him a palace, having noticed this, called together his neighbors, his slaves and his friends, to give him their aid; and lo! after a short time, the work was finished. Then said the Termite to the Spider: "If you had but done as I did, your plantation would have been laid out long ago." I once, in talking with a Negro named Quan, reproached his people with having killed off all the elephants for the sake of their ivory, and his answer was this: 'No, we have done no such thing. The elephants knew that the white man wanted the ivory, but they would not part with it without having something in return: so they went down to the coast, and sold their tusks for brandy. Having drunk the brandy, they were now left without anything—neither tusks nor brandy. So in their drunkenness they became desperate and all committed suicide, and that is why there are no longer elephants in Aquapin.'" *

"Man in his lowest stage of development considers himself and the brutes as almost alike, the difference between the two being, to his mind, rather external than internal and essential. The beast has a soul as well as man, and the soul of the beast is substantially the same as that of man. Men and animals belong to one race, and are identical with one another in sundry points." † How easy is the transition from man to animal, and *vice versa*, is shown in ancient German legends. "As in later times, after the grim legends of antiquity have been discredited, men become wolves and wolves are transformed into men, as we see in the belief in the Werewolf; so in primitive times men became dragons." ‡ The ancient ballads tell of Siegfrid's father and of his sister Signe, how they were transformed into wolves, and assumed all the savage instincts. This belief in "Marafilnas," the lycanthropi of the ancients, extends through Abyssinia, Senegambia and all eastern Negro lands as far as the Somali. Especially workers in

* *Cf.* Waitz, II 180.

* *Ib.* 343.
† Wuttke, I. 107.
‡ Vilmar, I. 121.

iron are supposed to transform themselves at night into beasts, and then to feast on human flesh. In Fassokl the Marafilnas are even organized into secret guilds.* The Indians in the interior of Oregon regard beavers as human beings, metamorphosed by the Great Spirit, in punishment of their disobedience.† In Mexican mythology, too, we find instances of such transformations. Xapan was, for adultery, changed into a black scorpion, and Tlahuitzin, the woman, into a red scorpion; and Xaotl was changed into a grasshopper, for having overstepped the powers given to him by the gods.‡ Lycaon was by Zeus transformed into a wolf. A number of German myths speak of the mutual transformations of men and serpents.§ The Centaurs and the Sirens show also how readily man and beast coalesce in Grecian mythology.

We have already seen from the instance cited in Chapter II. (the Arekunas) that there is nothing to prevent the greatest familiarity between the savage and the wild beast. The Malays of Malacca, and the Orangs consider the stronger animals as their own equals—especially the shark, whom they regard as a friend and a brother, he being, like themselves, a pirate. A similar view is taken of the tiger and the crocodile, and this view prevails throughout many of the East India, Philippine and South-Sea Islands.* In the East India isles it is believed that sometimes women give birth, not alone to boys and girls, but also to crocodiles, and the latter are never killed, but carefully placed in a crocodile pond. Many of the natives have their crocodile relatives, duly acknowledged, and these they never injure.† Hence the savage does not hold it to be a disgrace to be descended from beasts; on the contrary, they boast of such descent. The Tlascalans used to say that the men who escaped in the Deluge were transformed into apes, but that they by degrees recovered the use of reason and speech.‡ Kadroma, a she-ape, wife of the ape Cenresi, was the ancestress of the whole population of Thibet. The Thibetians are proud of this descent, and of their ape-like ugliness of feature, which they trace to their ape ancestors.§ Some of the Orang-Benua trace their origin back to white apes.‖ According to the Aleutians¶ and the Chippeways** all men are descended from the dog, and hence the first men had canine paws. Other N. American Indians say that a woman that lived with a dog was the mother of the human race.†† The Delawares suppose themselves descended from the eagle; ‡‡ the Tonkaway trace their origin to the wolf, §§ others to the raven, ‖‖ the Osages to

* Waitz, II. 180, 504.

† Cox, Ross, The Columbia River, 3 ed. Lond. 1832, I. 231; Dunn, Hist. of Oregon Terr. Lond. 1844, p. 317.

‡ D. Francisco Saverio Clavigero, Hist. antigua de Mejico, l. vi. p. 240: Entre otras contaban que habiendo emprendido un hombre llamado Japan hacer penitencia en un monte, tentado por una mujer, cometio adulterio: por lo cual lo decapito immediatemente Jaotl, a quien habian dado los dioses el encargo de velar la conducta de Japan. Este fue transformado en escorpion negro. No contento Jaotl con aquel castigo, perseguia tambien a su mujer Tlahuitzin, la cual fue transformada en escorpion rubio, y el mismo Jaotl, por haber traspasado los limites de su encargo, quedó convertido en langosta. A la verguenza de aquel delito atribuyen la proprietad del escorpion de huir de la luz y de esconderse entre las piedras.

§ Grimm, D. M. 394 ff.

* J. Hawkesworth, Account of the voy. undertaken for making Discoveries in the S. Hemisphere by Capt. Byron Wallis, Carteret and Cook, 1773. Lond. III. 758; Marsden, Valentyn.

† Hawkesw. III. 756, 757.

‡ Clavigero, VI. p. 225. *Cf.* Garcia, Origen de los Indios.

§ Klaproth, Tabl. hist. p. 131.

‖ Borie, in Tydschr. voor indische taal, land en volkenkunde. Batavia, X. 415.

¶ Sarytschew. R. in Sibir. II. 164.

** Waitz, III. 191.

†† Hearne, Voyage from Fort Prince Wallis to the North Sea (Germ. tr.), p. 281.

‡‡ Schoolcraft, V. 683.

§§ Wrangell, Statist. und ethnograph. Nachrichten über die russ. Besitz. in Am. (in Bär and Helmersen, Beitr. zur Kenntn. des russ. Reichs. Petersb. 1839) 100, 111, 93; Holmberg, Ethn. Skizzen üb. d. Völk. des russ.

‖‖ Schoolcraft, IV. 305.

a serpent transformed into a man, and married to the daughter of the beaver;* the Kayuse, Nez Percés, Walla-Wallas, and some other tribes are descended, according to a tradition held by them all, from the various members of the beaver:† some S. American aborigines from a fish, others from the toad, still others from the rattlesnake.‡

Conversely, several animals have a human origin. In Acra monkeys,—called "servants of the fetiches,"—are supposed to be men, whose creation miscarried; while among the Serracolets and on the Island of Madagascar they are supposed to be men who were metamorphosed on account of their sins.§ The Manitu of the Iroquois, to reward a man who, though sore pressed by hunger, had abstained from human flesh, transformed him into a beaver; and such is the origin of the Beaver totem. A Missouri Indian was changed into a snake that had the power of speech.‖ Owing to this close relationship beasts understand the language of man, and *vice versa*. In Bornu this mutual understanding of languages ceased when a man betrayed a secret to a woman.¶ In our legends and stories, too, animals speak, as did Diomed's steeds.

The souls of animals, and even of plants, enjoy the privilege of immortality.** The souls of men may pass into the bodies of animals, and animals' souls into men's bodies. Animals which root the bodies of dead men out of their graves thus make the souls of the deceased their own, devouring soul and body at once. This belief is oftentimes the foundation of the savage's reverence for animals, as is the case among the Kaffirs, who make an offering to the wild beasts of the bodies of the dead.††

To the larger beasts the savage often attributes a higher intelligence than he claims for himself. A very intelligent Indian seriously assured Parkman that he held the beaver and the white man to be the most ingenious of people.* Especially the white beaver, an animal which appears to exist only in fable, is represented as endowed with superhuman powers.† On the Senegal, in Kordofan and in Brazil, monkeys are possessed of a human understanding. It is believed by many savages that monkeys can speak, but refuse to do so, lest they should be forced to work.‡ Dogs, too, can speak, and in primitive times did speak: but since the time when the descendants of the god Kutka sailed by them without replying to their inquiries, they have proudly refused to speak any more. It is only strangers that they bark at now, or rather it is only strangers to whom they now address the question, Who are you? Where are you going? So say the Kamtchatdales.§ The Kaffirs say that the chameleon and the salamander are messengers sent on important errands to man by the god Umkulunkulu.‖ The Chippeways, like the Atnas, Kenai and Kolush,¶ suppose the world was called into existence by a bird. In the beginning there was only a vast waste of water: above this was poised a monstrous bird, the beating of whose wings was as thunder, the flash of whose eye was as lightning. He swooped down and touched the sea, and at once the earth came to the surface and floated on the water.** Birds passed for beings gifted with extraordinary wisdom among the ancient Germans, Greeks and Romans.†† The American In-

* Wilkes, IV. 467, *apud* Waitz, III. 345.
† Azara, Voy. II. 138.
‡ Garcilasso, Commentar. reales, I. 18, 21.
§ *Ib.* 178.
‖ M. v. Neuwied, II. 230.
¶ Kölle, African Native Literature. Lond. 1854, p. 154.
** Steller, S. 269; Georgi, Beschr. S. 383.
†† Waitz, II. 177.

* *Ib.* III. 193.
† Jones, Traditions of the N. Am. Ind., 2 ed. Lond. 1830, III. 69.
‡ Raffenel, p. 90; Rüppel, R. in Nubien, Kordofan, etc. Frankf. 1829, S. 115; Bosmann, II. 243; Bowdich, p. 195.
§ Steller, S. 280.
‖ Waitz, II. 410.
¶ Waitz, III. 179.
** M. v. Neuwied, II. 221.
†† *Cf.* Grimm, D. M. S. 388 ff.

dians credit the owl with greater intelligence than even the beaver or the rattlesnake, and treat him with the utmost reverence, call him "grandfather," and even incense him with tobacco-smoke — a solemn offering, with which oftentimes the morning sun is greeted. A legend represents the owl as one of the greatest benefactors of mankind, and he is considered to be the king or chief of the snakes.* In Mexican legend it was a dove that taught the dumb sons of Cojcoj, the Mexican Noah, to speak diverse tongues so that they could not understand one another.† On the mountain Kaf lives the monstrous bird Anka, endowed with reason and speech, known to the Persians under the name of Simorg, and in the Talmud called Jukneh. The books of the Zends tell of four sacred birds which are the guardians of the earth and of everything that lives thereon. Japanese mythology represents the bird Isi Tataki as the cause of the propagation of the human race; it was from him that the original divine pair got their knowledge of marriage rites. Chaldaic legend speaks of four worshipful beings, half man, half animal, which came out of the sea and made their appearance on the bank of the Euphrates near Babylon to give men instruction. The name of the first was Oannes, and he instructed them in those things which are pleasing to God, and gave to them religion, laws, science, culture; while it was the business of the other three to attend to the improvement of mankind by a repetition of the lessons given by the first. The Turks and the Arabs say that the cat meditates upon Mohammed's law, and that she will share with the faithful in the joys of Paradise, and they believe that the horse reads the Koran.*

From what has been already said not only will the fetichistic veneration of animals be placed in a clear light, but it will also appear that such veneration is necessarily incident to savage life. And it is the animal itself *in propria natura*, and without any reference to any divinity he may represent, that is worshiped. "The bear that is worshiped as a god is regarded as a true bear: the snake that is worshiped as a fetich is no mere passing theophania, but is ever a real snake."† It is not to be questioned that in the higher stages of development the worship of animals is connected with the *cultus* of spirits; and then the animals are considered as consecrated to the gods, and are on that ground worshiped: but that is beside our purpose.

The elephant is in Africa regarded as a superior being. The Kaffirs, out of respect to his understanding, will not eat his flesh. And yet they chase this animal, saying at the same time, "Do not kill us, great chief; do not trample on us, great chief."‡ In Dahomey he is the "great fetich" of the nation. Though the Dahomans are allowed to kill the animal, still they must perform a long purificatory ceremony after having slain one.§ In Siam the kings used once to appear seated on a white elephant, but that custom was abolished, for the elephant is as great a potentate as the king himself; and in him dwells a kingly soul. He has been even invested with imperial dignities.‖ The lion was worshiped in Arabia,¶ the tiger in New Calabar** and in the East India islands. In Sumatra the natives give the tigers warning whenever Europeans set snares to catch

* Parkman, Hist. Conspir. Pontiac. Lond. 1851, II. 135; Jones, III. 69.

† Clavigero, Lib. VI. p. 225: tubieron muchos hijos, pero mudos, hasta que una paloma les communicó los idiomas desde las ramas de un arbol, pero tan diversos, que no podian entenderse entre si.

* Arvieux, Mém. mis en ordre par le P. Labat. Par. 1735, III. 223, 252.

† Wuttke, I. 82.

‡ Kay, Trav. and Researches in Kaffraria. Lond. 1833, p. 125, 138.

§ Forbes, p. 9; Kay, p. 341.

‖ Meiners, I. 221.

¶ *Ibid.* S. 192.

** Holman, I. 371; Köler, 61.

them: and we read of *Tiger-cities*, where the houses are thatched with women's hair. In Acra, too, where almost each village adores as its fetich some animal peculiar to itself, the hyena is regarded as sacred.* At the Cape of Good Hope they will not kill the leopard, even though the animal devour women and children. It is thought in Dahomey that those who are torn to pieces by leopards are peculiarly blest in the next life.† The principal object of worship of the West Africa negroes is the wolf. A soldier belonging to a Danish fort, who was not aware of the sacred character of these animals, killed one of them. The indignant natives demanded of the Fort Commandant a reparation of the offense; and he was compelled to yield to the demand, as the negroes threatened to quit the district if he refused to comply. If satisfaction were not made the murdered wolf would take a fearful revenge on them and their children. Accordingly the Commandant had the wolf's body wrapped in linen cloths, and provided gunpowder and brandy for the solemn rite of atonement. The natives having, during the grand obsequies, fired off the powder and drunk the brandy, the wolf was propitiated and avenged.‡ Some negroes worship goats, sheep and rams.§ In New Calabar the horse is worshiped, and in Wadai this animal is the subject of many wonderful stories, and of a multitude of superstitious beliefs.‖ Indeed the horse, as also the ox and the cow, have been regarded as sacred the world over. The religious views of many Indian tribes with regard to animal-fetiches are very curious. "The highest worship is paid to the Onkteri Gods who created the earth and man, and who instituted the medicine-dance. In form they resemble huge oxen: amongst them the Spirit of Earth holds the pre-eminence, and has subject to him the serpents, lizards, frogs, the owl, the eagle, the spirits of the dead, etc. Another class of gods, sub-divided multifariously, is that of the Wakinyan, who are ever at war with the Onkteri, and who are principally destructive war-gods, though they possess also the creative power. To them the wild rice and a certain kind of grass owe their origin. In form they bear a fantastical resemblance to birds, and their home is on a lofty mountain in the west. The eastern gate of their dwelling is guarded by a butterfly, the western by a bear, the northern by the moose, the southern by the beaver," * etc. The worship of the beaver is diffused throughout almost the whole of America.†

Among birds it is the owl which is most frequently chosen for a fetich,‡ and even among our Teutonic ancestors this bird, as well as many others, was esteemed sacred.§ Many ancient Arab tribes regarded the eagle as their Great Fetich,‖ and by the Syrians the dove was worshiped.¶

In Africa, especially in Bonny; and in the E. Indian Islands, in Sumatra, Celebes, Butong, and the Philippines the crocodile is the principal object of worship.** In performing this worship, the natives go down to the haunts of the crocodile, to the sound of music vocal and instrumental, and throw food and tobacco to the animals. Nay, even in Celebes and in Butong tamed crocodiles are kept in the houses,†† probably because their presence is deemed lucky; and for this same reason, the Negro of Africa is glad when he finds these venerated animals dwelling near his hut without fear.‡‡ In Madagascar the cayman, the guardian deity of Little

* Bowdich, p. 362; Monrad, 33.
† Forbes, p. 35.
‡ Römer, S. 273 f.; Des Marchais, I. 297.
§ Bastian, 82, 208.
‖ Holman, Köler, ll. cc.

* Waitz, III. 190.
† *Ib.* III. 193.
‡ *Supra*, p. 77.
§ Grimm, D. M. 386–394.
‖ Meiners, I. 192.
¶ Xenoph. Anab. I. 4.
** Holman, Köler, ll. cc.
†† Hawkesworth, p. 757.
‡‡ Römer, 273 f.

Popo, is supposed to be an enchanted chieftain of old.* When the cayman takes any prey (so say the natives on the Senegal) he calls together his friends and kindred and counsels with them when the holiday is to be kept, for the distribution of the plunder. His most intimate friend is a bird, a kind of crane, which watches over him as he sleeps : and it is not permitted to kill this bird.†

In the E. India Islands,‡ as in Africa also,§ the shark is a mighty fetich along the sea-coast. Eels are worshiped in Cusaie and in the Marian Isles.‖ In the Carolines the God Mani is represented as a fish.¶ "At Eap there are kept in a pond of fresh water two fishes of extreme age, but yet only a span in length, which always stand in a right line, head to head, without moving. If any man touch them, and they are made to stand at right angles with each other, an earthquake is the result."** Xenophon states that the ancient Syrians paid worship to fishes ;†† and whoever ate of a sacred fish, his body was at once covered with ulcers, his bowels shriveled up, and his bones crumbled away.‡‡

"Mysterious in its whole nature ; amazingly agile though without limbs ; strong and formidable though simple in form ; of no great size and yet a match for the most powerful animals, owing to the instantaneousness of its attack ; gorgeous in its variegated coat ; silently and stealthily lying in wait for its victim, and then in an instant filling him with terror—the Serpent is an object of reverence to the savage, and is by him regarded as a mighty being of a higher order." * In America, Africa and Europe serpents have been worshiped, oftentimes, indeed, as being possessed by the souls of the departed, but often also as actual fetiches. The reverence paid by American Indians to the rattlesnake was the means of saving the life of the Count von Zinzendorf (1742). The Cayugas, with whom he was staying, were about to put him to death, supposing that his presence was productive of ill-luck to them. The Count was seated one night on a bundle of sticks, writing by the light of a small fire. Unknown to him a rattlesnake lay alongside him. When the Indians who were to take his life approached and observed the snake, they withdrew, firmly convinced that the stranger was of divine origin.† In Europe the Lithuanians worshiped serpents, kept them in their houses and made offerings to them : yet possibly they may have supposed them possessed by the souls of their departed kinsmen. We find mention of snake-worship as practiced by the Longobardi, in the Vita Sancti Barbati in "Acta Sanctorum." ‡ Herodotus speaks of this worship among the Egyptians.§ The guardian of the Athenian Acropolis was a living serpent.‖ But Serpent-worship finds its highest development in Whida, in Africa.¶ The Egyptian Apis alone can compare for importance, power and sacredness with the marvelous serpent which once gave to the Negroes of Whida the victory over their enemies. This serpent, which never dies, is held so sacred that not even the king, but only the High-Priest, durst see him face to face. The sanctity of this one snake confers consecration and immunity upon all other snakes of the same species, which are naturally harmless ;

* Leguével, II. 223.
† Raffenel, p. 29, 208.
‡ Marsden, Hawkesworth, ll. cc.
§ Holman, Köler, ll. cc.
‖ Dumont d'Urville, Voy. de l'Astrolabe. Par. 1830, V. 121.
¶ Schirren, Die Wandersagen der Neuseeländer und der Maurimythus. Riga, 1856, S. 70.
** Gerland, *ap.* Waitz, V. 2, 137; Chamisso, Bemerk. auf einer Enldeckungsreise (1815–18). Weimar, 1821, S. 132.
†† Anab. I. 4 : *ἐπὶ τὸν Χάλον ποταμὸν πλήρη δ'ιχθύων μεγάλων καὶ πραέων, οὓς οἱ Σύροι θεοὺς ἐνόμιζον καὶ ἀδικεῖν οὐκ εἴων οὐδὲ τὰς περιστερὰς.*
‡‡ Meiners, I. 193.

* Wuttke, I. 82.
† Waitz, III. 192.
‡ Grimm, D. M. 395 ff.
§ II. 74.
‖ Herod. VIII. 41.
¶ Bosmann, 458 ff. ; Des Marchais, II. 153.

and it is a high crime to kill them. While Bosmann was in Whida, a swine killed one of these snakes, and in punishment not alone was the individual transgressor put to death, but a general persecution broke out against the whole tribe of swine. Indeed they would have been utterly exterminated had not the Serpent granted an amnesty. Each time the crown is put upon a new head, the queen-mother and the new king himself make a solemn pilgrimage to the temple of the serpent. In the court of this temple the faithful pronounce their prayers, and offer valuable gifts. In case there be no earthquakes or other great calamities, which would necessitate special offerings to appease the wrath of the deity, there is annually held a grand festival, when hecatombs are offered. Still the High-Priest may at any time demand, in the name of the serpent, offerings of valuables, herds, and even human victims; and he must be denied nothing. There is engaged in the service of the temple a numerous host of priests and priestesses. The snake's harem is well stocked with beautiful girls. Every year the priestesses, armed with clubs, go about the country, picking out and carrying away girls from 8 to 12 years of age, for the service of the god. These children are kindly treated and instructed in songs and dances in majorem gloriam of his Snakeship. In due time they are consecrated by tattooing on their bodies certain figures, especially those of serpents. The Negroes suppose it is the snake himself that marks his elect thus. Having received their training and consecration, which are paid for by the parents according to their means, the children return home; and when they attain their majority are espoused to the Serpent. The happy brides, tricked out in festival array, are brought by their parents to the temple. When night comes, they are let down by twos or threes into pits where, as the priestesses aver, the authorized proxies of the snake await them. Meanwhile the old priestesses sing and dance around the pits. On the morning after the bridal night the girls are sent back to their homes; there these chosen maids have never been known to give birth to serpents, but only to perfectly human infants. During the remainder of their lives they enjoy eminent privileges, as being the lawful wives of the god, and receive a portion of all the sacrifices and gifts offered to him. They are permitted to marry a human spouse, and then their power over their husbands is unlimited. Should the latter presume to set themselves in opposition to the will of their divine helpmeets, they run the risk of being assassinated by the priestesses and by the other spouses of the god.

Traces of animal-fetichism are to be found even in the more highly-developed forms of religion. The Israelitish worship of the Golden Calf, and of the golden calves set up by Jeroboam is the product of a rude intelligence, as yet unfitted for the purer worship of Jahve, which belongs to a higher state of intellectual development.* The raising up of the Brazen Serpent by Moses, the sight of which healed the people of Israel, would appear to be a relic of ancient serpent-fetichism. (See above, *Fernando Po.*) Of the worship of animals among the Egyptians Bastian says:† "At Heliopolis and at Thebes, good care was taken lest travelers should peep behind the curtain. But when the specious cloak of philosophy, by means of which the Egyptians imposed on their neighbors, is stripped off, but little is to be seen beyond γόητες πάντες. What we should despise as stupid fetichism in a Negro tribe, was admired as the profoundest wisdom in the world's metropolis. The close connection between the usages of the ancient Egyptians, and those of the other African races, is too evident to be overlooked."

As we have already seen, the savage does not view his fetich as a being so exalted that in no case he may

* *Cf.* Merx, Art. *Abgottereei*, in Schenkel's Bibellexikon.

† San Salv. S. 300.

withhold from him obedience. His reverence for animals is all the more precarious, inasmuch as he is frequently brought into collision with them in the struggle for existence, as when hunger drives him to use their flesh for food, or when he is obliged to defend himself against the attacks of wild beasts. In such cases he kills the animal, how sacred soever it may be. The divine *nimbus*, however, which surrounds the animal is not thus dissipated, for the savage will pay due reverence to the body of the slaughtered beast, excusing his deed as best he may: having thus appeased the animal's soul, he contentedly feasts off its flesh, and clothes himself in its skin. "Hail, friend from the spirit-land," is the salutation with which the Indian greets the snake he meets; "we were unfortunate, and our friends yonder knew of it. The Great Spirit knew of it. Take this gift of tobacco (sprinkling tobacco dust on the snake's head); it will comfort you after your long journey." With these words he seizes the snake by the tail, passes his hand dexterously along the back, till he reaches the head, and then crushes the reptile to death. He strips off the skin, which he wears as a trophy.* "Be not angry with us," say the Indians to the bear they have killed, "for having slain you. You have understanding, and know that our children are hungry. They love you, and they want to eat your flesh. Is it not an honor for you to become food for the children of the great chief?" † Sometimes they appease the bear they have killed by placing in its mouth a tobacco-pipe, into the head of which they blow, filling the animal's throat with smoke, and meanwhile asking forgiveness. During a meal, of which the bear himself is the principal dish, they set up his head on an elevated place and chant songs of praise in his honor.‡ The Ostiaks attach the head of the bear to a tree, and pay it divine honor; then they utter their laments over its carcass, in doleful tones, inquiring, "Who has deprived you of life?" and immediately themselves giving the answer, "The Russians! Who cut off your head? The ax of the Russians. Who has stripped you of your hide? Some Russian's knife."* The inhabitants of Northern Europe, from a feeling of reverence, never call the bear by his own name, but only "the old man in the coat of fur." † When the Madagascans kill a whale calf, they make their excuses to its dam, and entreat her to go away,‡ just as the Kaffirs do, after they have captured an elephant.§

As fetiches generally, in accordance with the principles already explained (Ch. III.), are regarded as the causes of phenomena, which in point of fact stand to them not at all in the relation of effects, so too those animals which are worshiped are by their devotees arranged in causal relation with phenomena, whenever the true cause cannot be found. Hence the Yakutes regarded the camel as the cause of the small-pox (p. 24). The Mexicans first became acquainted on the one hand with the horse, on the other with ships, when the Spaniards came to their shores. The report and the flash coming from the guns of the latter they took to be thunder and lightning. Who produced these phenomena? Not men; of that they were quite sure. The horse, however, was something entirely new to them, and therefore they regarded the horse as the producer of the thunder and lightning, and on this ground worshiped him as a god. "At his departure Cortez left with these friendly people one of his horses that had received an injury in the foot. The Indians conceived a sentiment of reverence

* Waitz, III. 192.
† Lettr. édif. N. E. VI. 174.
‡ Charlevoix, p. 117, 300.

* Isbrand, Voy. au Nord. VIII. 411.
† Georgi, Beschr. S. 14, 21.
‡ Owen, Narr. of a Voy. to explore the Shores of Africa, Arabia and Madagascar. Lond. 1833, I. 170.
§ Moodie, Ten years in S. Africa. Lond. 1835, II. 333.

for the beast, as being in some way connected with the mysterious power of the white man. After their visitors had taken their leave, they offered flowers to the horse, and prepared for him, it is said, many savory dishes of poultry, such as they were wont to prepare for the sick. The poor beast starved to death with such novel food. The terrified Indians set up his image in stone, in one of their teocallis, and worshiped it as a god. When, in 1618, two Franciscans came to this locality (which was then as little known to the Spaniards as before Cortez's visit) to preach the gospel there, one of the most notable things they found was this image of a horse, which was worshiped by the devout Indians as the god of thunder and lightning." * Jacob Grimm cites numerous cases of animal-worship among the ancient Teutons. Thus, whoever kills the haus-otter (a small innoxious snake) will die within the year.† The killing of a swallow (which is a sacred bird) causes rain to fall for four weeks.‡ The giant eagle Hraesvelgr, in Northern mythology, causes the winds by beating his wings on the outer verge of the earth.§ The dew of morning is the foam that falls to the earth from the mouth of Hrîmfaxi, the black steed of the night.‖ Sköll and Hati, two gigantic wolves, are ever chasing the sun and the moon,¶ and hence it is that the latter ever speed on—a thing they would not do, were it not that they feared being overtaken by the wolves. Eclipses of sun and moon occur when the wolves overtake their prey, and have commenced to gulp them down; but fortunately the victims have so far been always successful in making their escape. In Oriental fable the dragon takes the wolf's place. The serpent Jörmungandr, which lives in the sea, encloses the whole earth in his folds. When he drinks there is ebb: but when he ejects water, there is flow of tide. In the mythology of Japan and China, when the dragon Tat quits the sea to saunter through the air, we have the waterspout.

7. *Men as Fetiches.*

A fetich is an object perceptible by the senses, to which, anthropopathically apprehended, man attributes causal power, and which he worships. Hence objects the most widely diverse becomes fetiches. Hence too, man himself, if the conditions unite in him, will be a fetich. Both in Africa and in America identical views are taken of those individuals who possess any extraordinary deformity, whether of body or of mind—for instance, albinos, dwarfs, hunchbacks, fools, etc. In Bornoo albinos are objects of fear, as beings gifted with supernatural power; * in Senegambia, if they are slaves, they are given their freedom, are exempted from all labor, and are cheerfully supported at others' expense.† In Congo the king keeps them in his palace, as "fetiches which give him influence over the Europeans." ‡ They are held in such respect that they may take whatever they will; and he who is deprived of his property by them, esteems himself honored. In Loango they are esteemed above the Gangas, and their hair is sold at a high price as a holy relic.§ Thus may a man become a fetich.

This fetichistic worship of man is a totally different thing from the respect which is paid to the man whose extraordinary power is due simply to the fact that he is the owner of certain mighty fetiches. This is the case with the ordinary fetich-priest, and with many kings, who by means of their fetiches may decree favorable or unfa-

* Prescott, Conq. Mex. II. 369.
† D. M. Anh. Aberglaube Nr. 143.
‡ *Ib.* Nr. 378.
§ D. M. S. 361.
‖ D. M. S. 368.
¶ D. M. S. 401.

* Kölle, p. 401.
† Raffenel, Nouv. Voy. dans le pays des Nègres. Par. 1856, I. 230.
‡ Bastian, 34.
§ Proyart, 172.

vorable weather, etc., as, for instance, when Ogautan and Möndull in the saga, by shaking their weather-bag (vedhrbelgr) cause wind and tempest; or when the Swedish king Eirîkr, surnamed Weather-hat (vedhrhattr), caused the wind to blow from the point toward which he turned his hat.* But if such power was attributed to the individuals themselves, and not to their fetiches, then they themselves became fetiches. Thus the Chitome of Congo is regarded as a fetich, as also, probably, the king of Usambara, whose power is so unlimited, that one of his subjects, describing the actual relation between ruler and subject, said: "We are all the slaves of the Zumbe (king) and he is our Mulungu (god)." † The Tamol of the western Caroline Islands appears to belong to the same class as the Chitome.‡ The nobility in those islands have unlimited power over the people, but they themselves in turn are subject to a Tamol in each separate island, and he is absolute monarch. Whoever approaches him on business, must come with his head bowed down to the level of his knees. He takes his position in silence, and awaits the Tamol's order to speak. The potentate's words pass for those of a god, and his hands and feet are kissed as often as a petition is addressed to him. The idolatrous worship of the princes of Tonga, whose touch suffices to make any object holy, also appears to be fetichistic. But of a different kind was the honor which, for instance, the Mexicans paid to Cortez; § the Sandwich Islanders to Captain Cook; ‖ the Kamtchatdales to the first Russian seen by them; ¶ the inhabitants of Cassegut to De Brue;** the Gilbert Islanders to the Scotchman Wood; †† the Oatafians to Captain Hale.* In these cases the motive was different: these white men were considered gods. Hence they were viewed not from the fetichistic standpoint, but from that of polytheism, the origin of which we have already pointed out. On this account the Gilbert Islanders carried Wood about in their arms, and the Oatafians entertained Hale (whose ship, as they thought, had come down from heaven) with solemn dances, lest they should offend the deity; and answered his questions in song. The white men were identified with deceased ancestors,† being supposed to be the latter either *in propriis personis* or in their ghosts. Accordingly, here we have no fetichistic worship.‡

* Grimm, D. M. S. 368.
† Krapf, Reisen in O. Afrika (1837–55). Stuttg. 1858, I. 291, note.
‡ Gerland *ap.* Waitz, V. 2, 116.
§ Acosta, p. 204.
‖ Cook's Last Voyage, III.
¶ Müller, Sammlung russ. gesch. III. 19.
** Labat, Voy. V. 172.
†† Gerland, V. 141.

* Hale, Eth. and Philol. (U. S. Exp.) Phil. 1846, 151 seq.
† *Cf.* Gerland, V. 141.
‡ This fifth chapter makes no pretension to an exhaustive treatment of its topics. Its object is simply to indicate the principal points of view, from which the various objects of fetich worship are to be regarded, with reference to the matter in hand. To collect and describe all the forms of fetichism in use among the various races of men, will furnish matter for as many special investigations as there are peoples and religions.

CHAPTER VI.

THE HIGHEST GRADE OF FETICHISM.

1. *The New Object.*

ALL the objects which we have so far considered as fetiches, how much soever they may differ among themselves, have this in common, that they exist in man's immediate environment: that they are within his reach, and almost all tangible. They are all circumscribed by the limits of earth, and mostly confined to the very spot which is the savage's own habitat: he necessarily comes in contact with them, nor is there any need of special search to find them out.

Furthermore, all the objects which the savage in the lowest stage of intellectual development considers use-

ful or desirable, belong in like manner to the earth; as all his aspirations and all his interests are concerned with earthly things. For what interests has he? Those of a spiritual nature are unknown to him, and those which he does recognize have reference simply to his physical well-being; his bodily appetites are the only stimuli which excite his will, and engage his whole attention. But how is he to gratify these appetites? The sky with all its stars will not appease his hunger, nor has the firmament power to sate his lust. The gratification of these appetites is to be found only here below. It is the earth alone that can give him the objects of his desire, and he has no wish for the things lying beyond. For us these earthly objects are become also objects of higher, more spiritual interest, inasmuch as we have made them objects of knowledge; but they are not at all objects for the savage in this sense. He has no desire of knowledge for knowledge' sake: he desires things only so far as they can gratify his grosser passions. Whatsoever does not minister to these, is of no interest for him, is no object for him, does not arrest his attention; just as animals "in the state of freedom only have perfectly clear conceptions of the few things which are closely connected with their daily wants and with their daily life, but suffer everything else to pass by almost unnoticed."* A plant is an object for the savage only in so far as it may supply food: it has no value for him as a botanical specimen, and it is only as an article of food that it can interest him. These mere bodily interests of his are amply secured within the narrow earthly world with which he is acquainted. So long as he experiences none but simply physical interests, he rests content with his contracted world, and his mind remains confined within its narrow sphere. If therefore his world is to extend its limits, and his mind to take a broader range, he must experience some higher interest. But now the will is never without its object, never stands by itself as *will* simply, but always as will *determined*, always as will directed towards an *object:* and it ever extends just as far as its objects. If therefore a higher will, a higher interest is to be awakened, a new object must necessarily be attained, by impelling toward which the energies of the will we give them a new direction and elevate them. But of what kind must this object be, in order to awaken a new and a higher interest?

To arouse such interest in the savage mind it must be adapted to the savage's modes of apprehension. If it had no aspect which the savage mind might grasp, it could excite in it no interest. Let us see the mode and the measure of the savage's mental grasp. Abstract ideas, spiritual conceptions, purely mental phenomena are to him unintelligible, and consequently uninteresting, indifferent. He apprehends only what is apprehensible through the senses, or what he can *see*. The new object, therefore, if it is to excite an interest in his mind must be one that is apprehensible through the senses.

But the new object must awaken in him a higher interest than any he has hitherto known, and to this end the interests which hitherto have stimulated him must in some degree be repressed. Now it is the new object which has to do this. Let us see what kind of objects will *fail* to displace the old interests, or in other words the bodily appetites of hunger and lust, and the natural emotions such as joy and anger, which have been hitherto supreme. The savage has so far recognized only these, and has prized only such objects as answer to them. So long as he comes in contact with such objects as these, so long will this class of interests be served and go on growing. The objects therefore which answer to these appetites and passions will never tend to check the growth of inferior interests. They are only to be repressed

* Waitz, I. 329.

by some object not answering to them, nor tending to enhance them, but which, *nevertheless*, can engage the savage's attention. If it can do this without at all gratifying his bodily appetites, the will of the savage will be thereby to a certain degree weaned of these appetites and turned in a new direction, *i.e.*, will have a new interest. Therefore the new object must not serve in any way for the gratification of sensuous desire; for whatsoever has that tendency belongs to the sphere of the lower interests, and so to the sphere of pure savagery. And conversely, everything that has hitherto been comprised within the sphere of the savage serves, in so far as his interests are centered in it, to gratify these sensuous desires, they being as yet his only interests. Hence every object which lies within his immediate sphere is liable at any time to become merely the object of these desires. If then the new object is to be of such a nature that it will not answer to these desires, it must be so remote from the savage's immediate sphere that these sensuous desires can never in it find their gratification: and it must ever stand on a plane high *above* these, never *beneath* them. Such grand objects as a mountain or the sea do not, it is true, serve to appease hunger or to gratify lust, but still they may in some manner be subordinated to the savage's will and desire: he can ascend the mountain, set his foot upon its summit, break fragments of rock from it, etc.; he can sail upon the sea, take water out of it, scourge it, etc. And so every object upon the earth may be brought into subjection to his power; and hence the new object must lie entirely beyond the limits of earth, and beyond the sphere of his sensuous desires. But now since it can in no way gratify these desires, and still must excite an interest in the savage's breast, how is it to attain its end? As we have seen, it must not be an object of sensuous gratification, nor yet an object for use or for consumption. But if the savage cannot employ it for sensuous gratification, and yet is to make it an object of contemplation, his attitude towards it must be one of attention, gazing, observation. Hence the new object, which is to repress sensuous desire, must be of such a nature as to rivet the attention, and to draw upon itself the gaze of the savage. It must therefore be visible, and as has been already said, an object apprehensible by sense. Now what is that object of sense which alone can rivet his attention, and yet never be subordinated to man's use? Since it must not lie within the sphere of his sensuous desire, it must consequently lie without the earth: and yet it must be observable by the senses, and specially fitted to engage the attention—hence something noteworthy and wonderful which shall surpass all things else in splendor. But now if this object could be contemplated and its properties ascertained in a moment it could engage the attention of the savage only for a brief space, and then he would be again free to give himself up anew to merely sensuous gratification. The new object must therefore not alone surpass all others in magnitude and splendor, but it must also be so vast and stupendous, that man may find no end of contemplating it, that it shall lead him on to ever new contemplations, and so ever withdraw him from ministering to his sensuous appetites. If then there be found an object which irresistibly challenges his attention merely as an object of contemplation without in the least gratifying his lower passions, he has henceforth, in addition to his former sensuous interests, a new one which consists in observation, contemplation: and this new interest we call an intellectual one, as contrasted with the other, which is sensuous or materialistic.

Thus the savage could acquire an intellectual interest only through some object of sense lying without the sphere of his passions, and hence extra-terrestrial, which, however, was

fitted to engage his attention by attracting his gaze: which should be possessed of preëminent sensuous splendor and be of such grand proportions that it might be contemplated forever and still ever invite to fresh contemplation. Now of all the objects in the universe there is but one which fulfills all these requirements, and that is the Firmament with its countless stars. The sky is the new object, being perceptible by the sense—the mightiest, grandest and most stupendous of all the objects of sense, with its blazing sun, its shining moon, its twinkling stars, its rosy blush at morn and eve, and the deep blue of its mighty arch. By the splendor of its ever-changing and sublime phenomena, it invites the savage to the contemplation of itself, without ministering to his lower nature. Thus this new object gives to his will a new direction, a new interest—that of contemplation, of thirst for knowledge: an intellectual interest.

We must go back in imagination to the time when man was without knowledge, when all was ignorance, when there was no school to give instruction, as instruction is given now. Then every step toward knowledge was an advance into the unknown land, and individual observation was the only schoolmaster. But observation was limited to those objects which Nature afforded: hence Nature was, after all, the true Teacher. Were it not that there was in the universe an object which irresistibly challenged attention, without ministering to man's lower passions, and which thus in some measure diminished the force of the latter, man could never have risen above his animal instincts, nor ever have conceived an intellectual interest. Hence wherever the savage has not yet made the heavens the object of his contemplation, we may be sure that his condition is that of extreme barbarism, which latter however diminishes, in proportion as his knowledge of the heavens advances. The firmament is the first object which awakens in him intellectual interest. It is only after he has with some interest contemplated this object, that his mind goes out to observe the universe, for knowledge' sake, and to study the other objects upon the earth, as objects of knowledge, which before were only objects of desire. This is perfectly consequent, for so soon as *one* thing is regarded with intellectual interest, all other things will be regarded from the like point of view, since they are all mutually related. Hence, of all the sciences worthy of the name, astronomy is the oldest and the first; and hence too do we find, even in the remotest historic times, and among the most ancient peoples, that the results of astronomy, such as the ascertainment of the year's length, and kindred facts, are more correctly apprehended than the results of any other science. The science of the heavens, so soon as there is any demand among savages for scientific knowledge, constitutes the first object of scientific instruction. I have said, *scientific* instruction, to distinguish it from religious, which no doubt precedes astronomical instruction: but this precedence of religious instruction is due simply to the fact that it is based upon a total ignorance of Nature, which of course is prior to knowledge. But the earliest scientific knowledge that man acquires is that of astronomy. Leaving out of view the instruction the savage gains as to the objects in daily use, even the rudest of savages oftentimes receives religious instruction, but never anything that can lay claim to the title of scientific education. If therefore we anywhere find scientific instruction given (and the first lessons will be always in astronomy) we may confidently assert that mental development has made considerable progress. This is verified in the case of the South-Sea Islanders in the Carolines. Canova, in describing the Caroline Islands, says, "In each district there are two places of public instruction, in the one of which the boys, and in the other the girls receive instruction in astronomy,

as far as the natives' knowledge of that science goes. The master in giving his lessons uses a globe, on which the position of the principal stars is indicated with rude art."* Hence, too, astronomy is the first subject-matter of early scientific literature. The books of the Mexicans had on one page mythological figures, ritual directions, laws and the history of the country, while on the opposite page, out of all the objects of theoretical science, they set forth only those of astronomy and chronological calculations.† The "innumerable books" of the people of Yucatan, whose mental culture was about parallel with that of the Mexicans, give the constellations, chronological calculations, and the fauna and flora, and political history of the country.‡ Science in antiquity developed similar phenomena in its beginnings, and the library of a German peasant consists of a hymn book and an almanac.

We will suppose the savage, then, beginning to contemplate the heavenly bodies with some interest. The phenomena which these produce, viz., light and heat, and all the effects of these latter, have so wide an influence, and so intimately concern man himself, and further, it is so patent that these heavenly bodies are in truth the efficient causes of the phenomena, that man establishes a relation between them and his own life, between them and all Nature. There can be nothing on earth mightier than they, their influence pervading all space: they are supreme, they can account for everything, they are for man Ultimate Causes. But these causes do not for him operate through mechanical laws: they are not for him inanimate bodies, being, like all other objects, apprehended by him anthropopathically. Hence they have life and will, even as man himself—and thus they become the supreme fetiches. But their energies are not restricted to the production of storms and tempests: man sees his own fate as depending upon their decrees. The changes which he observes taking place among them he interprets as tokens of their good-will or their enmity, their favor or their displeasure; and hence it is that the early contemplation of the heavens, as being coupled with anthropopathic apprehension, is necessarily fetichistic, and that astronomy makes its first appearance as astrology; hence, too, the latter precedes the former chronologically.

2. *The Gradual Acquisition of Knowledge.*

Time was when the heavenly bodies were not yet an object of contemplation. We do not say that then man did not notice, did not see the sun, moon and stars—even brute beasts have so much cognizance of the heavens: but the time was when man had no definite notion of the heavenly bodies, when he knew nothing either of the mode or of the regularity of their movements, or of their periods: in short, when his knowledge of them was limited to the general sensuous impression. Later he comes to see in the heavens an object made up of distinct parts. Between the point of departure, nescience, and this term, knowledge, lies the period of gradual acquisition, where, starting from small beginnings, the mind advances step by step to knowledge. Let us form a clear conception of the order in which the heavenly bodies would by degrees come to be known to man, and we shall at the same time understand the order in which they presented themselves to him as objects of fetichistic contemplation.

When he begins to observe the sky with its various phenomena, his knowledge is limited to the sensuous impression. But in this case the observer is not one who has pushed his investigations deeply into other subjects, and now to this new investigation brings a disciplined mind which can keenly analyze the phenomena;

* Gerland *apud* Waitz, V. 2. 110.
† Waitz, IV. 171.
‡ Waitz, IV. 311.

he is only an overgrown infant, with powers of thought all undeveloped. Such an observer will be chiefly guided by the impression left by the object on his senses. Hence that heavenly body which appears most striking to the eye, which exhibits the greatest number of varying phases, and which is easiest observed, will first attract and rivet his attention. Now such an object is not the Sun, but the Moon: and hence we find that, among savages, the latter is worshiped at a much earlier period than the former, and is considered of higher importance.* This fact, which to us who can more truly estimate the relative importance of the two luminaries, appears at first glance unaccountable, admits of a very easy explication, when we consider on the one hand the exterior, sensible aspects of the two, and on the other hand the intellectual status of the savage.

In the first place the savage has in the day-time little leisure for the contemplation of Nature in general, or of the Sun in particular: he must needs find his daily provision, and this care engrosses all his attention. For the more perfect the means and the implements, the machinery he employs, the sooner can he supply his bodily wants, and the more leisure he has for mental development. But the less developed he is, the clumsier are the means at his command for taking his prey, and the more time does he consume in gathering together his daily provision; and hence a Tierra del Fuegian is his whole life long occupied with this one care, and this is his sole employment, viz., to gain his sustenance. As he neither sows nor plants, and as the desert region in which he lives yields him scarcely one natural product, he must needs be restricted to this one pursuit. If perchance he succeeds in finding a sufficiency for the present, the search has wearied him and he seeks repose in sleep: and when he awakes the renewed cravings of hunger compel him again to resume his search. Thus, if he would support life, he must through the day keep his eyes steadily fixed on the earth. And then the Sun is no such object as would through the day very forcibly claim the attention of a man whose mind is void of thought, and whose only care is to still the cries of hunger. All nature is now bathed in light; there are no dark shadows, no contrasts; and contrast it is which enables an object to make a very deep impression. Day with its light is a very common occurrence—it is indeed a fact of *daily* experience. But suppose that the man directs his gaze toward the sun: beyond its daily traversing the heavens, no phases are observable which might readily impress the savage mind. The Sun changes not like the Moon: those changes which we observe in the place of its rising, from solstice to solstice, take place so gradually, and require so long a period, that only close observation can detect them at all; and for this the savage has neither the will nor the perseverance. Hence the sun is an object rather of meditation than of contemplation; and to study it requires a rather highly developed understanding. It is very different with the moon. At night the savage has finished his daily toil; his wants are supplied: hence he is now at leisure. But, most important of all, the effect of contrast is here to be observed. The earth is wrapt in darkness; the superstitious savage meanwhile shudders with fear, while every nerve and every sense is on the stretch. Then emerges from beneath the horizon the bright orb of the full Moon, round as a wheel, red as fire. Then how manifold are its apparitions, the like of which are never to be seen in the Sun, and which are specially fitted to call forth the astonishment of man, and to invite him to reflection. Now she is fiery red, in a moment pale and wan; at one time a majestic full orb, at another wasted away, and resemb-

* *Cf.* Wuttke, I. 66.

ling a sickle. The dark spots upon her surface lead men to fancy that she has a human face, or give rise to other imaginations: oftentimes she is totally eclipsed. In short, several peculiar and directly visible phenomena are observed in the moon, which must attract the attention of man, and cause him thither to direct his gaze. He will also attempt to assign causes for these phenomena, and these attempts, how inept and anthropopathic soever they may be, still will at least have this effect, that they will connect notions together, *i.e.*, will serve as the first steps in thinking. Thus then we need not be at all surprised if when a rude people first begin to contemplate and to worship as fetiches the heavenly bodies, the Moon has precedence of the Sun.*

But after the Moon has become an object of man's contemplation, it is not now the Sun which he next studies, but certain stars which, as they appear in the gloom of night, affect him more sensibly and offer for his contemplation properties stranger and more easily observable than does the Sun. There are five stars and constellations † which first attract the notice of man, and which we always find recognized by such savages as have even made a beginning in the study of astronomy. The first is Venus, which with its brilliant light attracts attention, particularly by appearing first of all the stars in the evening, and vanishing last of all in the morning—the Morning and the Evening Star, which at first passed for two distinct luminaries, and which Pythagoras was the first among the Greeks to recognize as one.‡ Next is the Ursa Major, the Great Bear, or the Wain, which never drops below the horizon in the northern hemisphere; together with his counterpart, the Ursa Minor, the Little Bear; both of these being noticeable from their peculiar form. Then that chain of three brilliant stars, known to the Greeks as Orion, which the people in Upper Germany still call the Drei Mäder (Three Mowers), because they resemble three mowers standing in the meadow one behind the other.* Finally, the space so thickly gemmed with stars, situate between the shoulders of Taurus, and of which chiefly seven (more exactly six) are easily discernible — the Seven Pleiades, which are distinguished as being in the center of the glorious system of the Milky Way, and which gain all the higher eminence from the fact that the space all around them, to the extent of six of their diameters, is relatively poor in stars; and from this, that for many regions of the South these stars never set. These five are the first to be recognized: they are *popular* stars the world over. It is toward these that Odysseus directed his eyes when, quitting Calypso's isle, he takes his homeward course over sea:

Αὐτὰρ ὁ πηδαλίῳ ἰθύνετο τεχνήεντως
Ἥμενος· οὐδέ οἱ ὕπνος ἐπὶ βλεφάροισιν ἔπιπτεν
Πληϊάδος τ' ἐσορῶντι καὶ ὀψὲ δύοντα Βοώτην
Ἄρκτον θ', ἣν καὶ ἅμαξαν ἐπίκλησιν καλέουσιν,
Ἥ τ' αὐτοῦ στρέφεται καὶ τ' Ὠρίωνα δοκεύει,
Οἴη δ' ἄμμορός ἐστι λοετρῶν Ὠκεανοῖο.

Od. V. 270 seqq.

These Hephæstos represented on Achilles' shield (Il. xviii. 487 seqq.). Of these it is said: "Canst thou check the sweet influence of Chima (Pleiades) or loose the band of Kesil (Orion)? Canst thou order Mazzaroth (Sirius) in his period? or canst thou lead Aish (Arcturus) with his sons?" (Tob. xxxviii. 31.) "Who made Arcturus and Orion and the Pleiades and the chambers of the South?" (Tob. ix. 9.) These were the favorite stars of the Ancient Germans, the Sclavs and the Finns.†

That the Moon was the first among the heavenly bodies to be distinctly studied by man, and that the stars and the Sun followed after, is clearly

* *Cf.* W. Whewell, Hist. Inductive Sciences, Vol. I.
† *Cf.* Grimm, D. M. S. 416.
‡ Whewell, Hist. Induct. Sciences, Vol. I. 106.

* Grimm, D. M. 417.
† D. M. 416.

evinced by the different modes of reckoning time at various periods and in various nations. The mode of reckoning by Moons is the primitive one. We meet with it in the earliest historic records of all civilized nations, and hence we also find it wherever a nation is in the lower stages of development. Here we meet with reckonings by Moons, and by the movements of certain stars: but never by the sun's periods. Nations in this stage of development are raised very considerably above the condition of the rudest barbarism. Last comes the reckoning by the Sun, and this indicates an intellectual status which leaves far behind it the barbarism of savage tribes.

Not to speak of the civilized nations of Europe and Asia, who in early historic times reckoned by moons, this mode of reckoning time is to this day followed throughout Africa * by most of the Negro tribes, as also in America, by the aborigines. The Indians of the latter continent generally reckon thus, and their months bear the names of various objects in Nature, especially animals and the products of the earth.† "Like most of the other tribes, the Dakota Indians reckon twelve months, five each for Summer and Winter, and one each for Spring and Autumn, and add an intercalary month every second year. According to Carver (216) and Heckewelder this intercalation of a so-called "lost month" without a name, occurred every 30th month: but according to Kohl (I. 167), every year. Schoolcraft (V. 419) says that the Algonquins reckon only eleven months, which are brothers, and take to wife, in succession, one woman, the Moon. The Algonquins do not appear to find any difficulty in the fact that between winter and winter there are now 12 now 13 months.‡

The next step in astronomy is to reckon time by the moon and the stars together, excluding the sun, except for noting the hours of the day; and this mode of reckoning is found among some of the more advanced of the American tribes. The Iroquois and the Ojibbeways had special names for a number of stars; and the latter defined with precision the hours of the night by the rising and setting of these. The Osages, too, marked the progress of night by the stars, and recognized Venus, the three stars in Orion's belt, the Pleiades, and even the Polar Star and the apparent revolution of the neighboring stars around it.* But it is among the natives of the Marian and the Caroline Islands that we find this mode of reckoning time best developed. The Caroline islanders not alone define the periods of the night by the stars, but even divide the year into seasons according to the ascent of certain stars at fixed times; and into months, each having a fixed number of days, according to the moon's several phases. Not alone has each day, but also each division of the day, a distinct name.† "According to Freycinct (2. 105) the number of their months was ten, and of these, five (from June to November) constituted the season of winds and rains, and the other five the temperate season. But that writer himself doubts whether they had not two modes of reckoning the year, the one founded on climatic reasons, the other on lunations, and giving a greater number of months than the former." Among the natives of the Marian Islands there were two parties, one of them counting twelve, and the other thirteen lunations to the year; and their disputes once even led to a war. The Caroline men, besides traversing the sea all round their own group of islands for business or pleasure, visit also, whether singly or in squadrons, the Marian Islands. In making this voyage they direct their course according to the starry heavens, which they divide into twelve regions. Cantova makes mention of these twelve

* Waitz, II. 224.
† Waitz, III. 224.
‡ Waitz, III. 224.

* Nuttall, Journal of Travels into the Arkansas Territory. Phila. 1821, 172 seqq.
† Gerland *ap.* Waitz, V. 286.

regions and of the twelve winds named by the Caroline men. But they had also another division of the heavens into twenty-four regions, which took their names from the stars which rose and set in them. They guide their course at sea by these regions, as also by the sun, stars and constellations, whose rising and setting they can observe, and to which they give special names."* Of the astronomical instruction in vogue amongst them we have already spoken.

The reckoning of time by the sun is therefore of more recent origin than the reckoning by the moon and stars. Among the Mexicans, who reckoned solar years, many regarded the planet Venus to be more ancient than the sun.† The discovery of the solar year presupposes an extended and laborious observation of the sun, and so a high degree of spiritual interest. Hence we might à priori assert (and experience will confirm the assertion) that wherever the solar year is accepted as a measure of time, culture has gone far beyond its barbarous stages. We may go farther (and here too experience will come to our support) and assert that the worship of the sun is only possible where the mind has reached a degree of development far higher than that required for the worship of the moon and stars. The nations which have brought the worship of the sun to its highest perfection are civilized—the Persians, for instance, the Phœnicians, Carthaginians, Mexicans and Peruvians.

3. *The Worship of the Moon.*

The first and lowest stage of the worship of the heavenly bodies is that where the Moon is worshiped and regarded as of more importance than the Sun.

The Kamtchatdales have not yet reached this stage, worshiping, according to Steller, neither Sun nor Moon.‡ The Payaguas, of S. America, on perceiving the New Moon beat the air with their fists, to give expression, as they say, to their gladness. Azara, who relates this fact, further says: "Ce qui a donné lieu à quelques personnes de croire qu'ils l'adoraient; mais le fait positif est, qu'ils ne rendent ni culte ni adoration à rien au monde et qu'ils n'ont aucune réligion."* This joy of the savage on beholding the luminous heavenly bodies leads him to contemplate them, and he soon begins to regard them as the causes of occurrences which in no wise depend upon them. The Botokuds think the moon is the cause of most of the phenomena of Nature.† In the Pelew Islands predictions are made from the appearance of the Moon.‡ Hence the Moon soon passes for a mighty fetich, and so is held in greater consideration than the Sun; and accordingly the Moon would be naturally regarded as a Man, the Sun as a Woman. Bleek says, with respect to the Hottentots, "In the lowest stage of culture to be met with among nations having sexual language, the worship of the heavenly bodies acts a very unimportant part, for the reason that the knowledge possessed by savages of the motions of these bodies is too slight to give a basis for reverential contemplation. And yet we find even here the rudiments of the mythologic (*i.e.*, anthropopathic) conception. . . . For first the phases of the Moon will excite attention. Her gradual waxing and waning gives to the savage the notion of a Being which grows for a while, and then decays, and he readily personifies it. Hence it is not improbable that Moon-worship was the earliest phase of the worship of heavenly bodies. The Hottentots, as we are assured by Kolb, a competent witness, pay divine honor to the Moon. In their language ‖khāp §

* *Ibid.* 85.
† Waitz, IV. 146.
‡ Steller, Kamtschatka, S. 281.

* Azara, II. 137.
† Pr. M. v. Neuwied, R. n. Brasil, II. 58 f.
‡ Hockin, Supplem. to the Account of the Pelew Islands. Lond. 1803, p. 15.
§ ‖ expresses the lateral clicking sound; Kh is a guttural consonant, and ~ marks the nasal tone.

(Moon) is, as in ancient Teutonic, masculine, and the Sun feminine." The Namaquas, an offshoot of the Hottentots, regard the Sun as a lump of "clear fat," which seafarers attract to themselves by enchantment during the night, and then spurn after morning has come, and they have no further need of it. The Moon, on the other hand, they regard as a more important personage than even their own chief Spirit u-Tixo. He (the Moon) once commissioned the Hare to inform mankind that even as the Moon always recovers again his fullness after he has lost it, so they too may come to life again, after death. The hare mistook the message and told men that they must die away, even as the moon does. This was the origin of death. Old Namaquas never eat hare-flesh, probably because this animal is regarded as a divine messenger. The waning of the moon is due to his putting his hand up to his head when he has a headache.* The Mbocovies, neighbors of the Payaguas, take some of the stars for trees with luminous branches, and others for an ostrich pursued by dogs. (*Cf. supra*, Ch. III. § 3.) The Sun, they say, is a woman who once fell upon the Earth, and caused thereby great calamity: it was only with great difficulty that she was restored to her place. But the Moon is a man: and his eclipse is caused by a dog tearing out his bowels.† The Navajoes say that the Moon is a man riding on an ass: but that the Sun is set up in the heavens every morning by an old woman.‡ The Greenlanders say that Anningat, the Moon, is a man who is in pursuit of Mallina, the Sun, his sister, with whom he is in love.§ By the Lithuanians, Arabs ‖ and Hindus ¶ the Moon is also regarded as a man. Our Teutonic ancestors had the same opinion: "Audio veteres Germanos Lunum quoque deum coluisse et appellasse Hermon, id est, dominum Lunum (Herr Mond)." (Gesner, *Mithridates*, Tur. 1555, p. 28.) Hulderic. Eyben (De titulo nobilis. Hemst. 1677, 4, p. 136) says: "Qua etiam ratione in vetere idololatrico luna non domina, *dominus* appellatur:

Bis gottwillkommen, neuer mon, holder herr,
Mach mir meines Geldes mehr.

And Eligius: nullus *dominos* solem aut lunam vocet. The Sun, too, they regarded as a woman: Vetulam novi, quæ credidit solem esse deam, vocans eam sanctam dominam. (Nicolaus de Gawe *ap.* Grimm.)* The Greeks had for the Moon the two appellations *μὴν*, masculine, and *σελήνη*, feminine, and *μὴν* is the more ancient name. The Romans likewise had the two words Lunus and Luna.† The citizens of Carræ believed that whoever regarded the Moon as a male deity, would be lord over women: whoever held him to be female, would be their slave.‡ With regard to the utterly barbarous aborigines of New California Bägert§ states that not alone are they without social organization, but that not even the trace of any religion is to be found among them. Picolo's account contradicts this, for he says that they worship the Moon.‖ The Panches are by Gomara ¶ said to wor-

* Waitz, II. 342.

† Guevara, Hist. Paraguav, Rio de la Plata y Tucuman, I. 15. *Cf.* Waitz, III. 472.

‡ Davis, El Gringo, or New Mexico and her People. N. Y. 1857, p. 414.

§ Grimm, D. M. 400.

‖ *Ibid.*

¶ Muir's Sanskrit Texts, vol. v. p. 76. "In Indian mythology the Moon is a god, not a goddess."

* D. M. 400 ff.

† Macrob. III. c. 8. *Cf.* Meiners, I. 389.

‡ Spartian. in Vit. Anton. Carac. c. 7. Et quoniam Dei Luni fecimus mentionem, sciendum, doctissimis quibusque id memoriæ traditum atque ita nunc quoque a Carrenis præcipue haberi, ut qui lunam fœmineo nomine ac sexu putaverit nuncupandam, is addictus mulieribus semper inserviat: at vero qui marem deum esse crediderit, is dominetur uxori, neque ullas muliebres patiatur insidias. Unde quamvis Græci vel Aegyptii eo genere quo fœmineam hominem, etiam Lunam deam dicunt, mystice tamen deum dicunt.

§ Bägert, Nachricht. v. Californ. S. 168

‖ Ap. *Waitz*, IV. 250.

¶ Hist, gen. de las Indias, in Historiad. prim. de Ind. Madr. 1852, p. 202.

ship Sun and Moon, while Piedrahita * expressly affirms that they worship the Moon only. But these conflicting statements may perhaps be reconciled if we recollect that Piedrahita's account is of earlier date than Gomara's: thus Gomara's narrative would exhibit the progress to the worship of both Sun and Moon from simple Moon-worship. The difference between Bägert and Picolo admits of a similar explanation. With regard to the Kaffirs, too, we have accounts on the one hand asserting that they do not regard Sun or Moon as objects of worship, though they hold them to be animate beings; and on the other hand accounts affirming explicitly that they hold festival and conduct religious dances at the time of the New Moon.† The Maravi celebrate the return of the New Moon.‡ Traces of the old German moon-worship, in addition to those already mentioned, are found in the following passage from Nicolaus de Gawe's work *de Superstitionibus:* "Insuper hodie inveniuntur homines tam layci quam clerici, literati quam illiterati, et quod plus dolendum est, valde magni, qui cum *nouilunium primo viderint flexis genibus adorant: vel deposito capucio vel pileo inclinato capite honorant* alloquendo et suscipiendo. Ymmo eciam plures ieiunant ipso die novilunii, sive sit dies dominica in qua secundum ordinacionem ecclesiæ non est ieiunandum propter resurrectionis leticiam siue quacunque alia die, eciamsi esset dies dominice nativitatis. Quæ omnia habent speciem ydolatrie, ab ydolatris relicte." §

The Moon being an animated thing and regarded with such veneration, it cannot surprise us to find the liveliest sympathy excited in her favor, especially whenever she appeared in danger of perishing, *i. e.*, when she is eclipsed. We have already seen that several tribes of savages account for this phenomenon by attributing it to the attack of a wolf on the Moon. Hence they hasten to render her assistance by making a fearful noise, with a view to frighten the monster away.* "Nullus, si quando luna obscuratur, vociferare præsumat," says Eligius in a sermon. "Vince Luna," was the cry of the Romans, prompted by a similar belief: and we meet with the same usage in other nations, for instance, among the Christians of Abyssinia.† The Mbocovies, as we have seen, supposed that a dog was tearing out the entrails of the Man-Moon. Similar beliefs are entertained by American Indians, and this circumstance will explain their custom of beating their dogs, during an eclipse of the Moon, as the Hurons did, according to Charlevoix, and also the Peruvians. The Potowatomies, who are Sun-worshipers and who regard the moon as a maleficent deity, as compared with the Sun, suppose that in the Moon there dwells an old woman who weaves a basket, on the completion of which the world will come to an end: but the basket is always torn in pieces by a dog, before it is finished. Whenever the woman struggles with the dog there is a lunar eclipse.‡ Many of the South Sea Islanders explain this phenomenon differently,§ accounting for it in accordance with the dogmas of Soul-worship, which appears to overmaster their fetichism, and to force it into the background. According to them the Moon is the food of departed spirits, and by feasting off it, they make it smaller; just as the Dakota Indians say that the waning of the Moon is caused by the gnawing of a number of little mice (Mice-souls?). But it ever waxes again. When therefore the Moon is eclipsed, these islanders

* Hist. de las conq. del nuevo reyno de Granada, I. parte. Amberes, 1688, V. 1.

† Waitz, II. 411 f.

‡ Monteiro in the Ztschr. f. Allg. Erdkunde, VI. 260 ff. Ausland, 1858, p. 260; Waitz, II. 419.

§ Grimm, D. M. Anhang. S. XLIV.

* *Cf.* Grimm, D. M. 401.

† Waitz, II. 503.

‡ De Smet, Missions de l'Oregon et Voyages aux. Montagnes rocheuses (1845). Gand. 1848, p. 298.

§ Turner, p. 529 seqq.

are alarmed, lest the souls should go without sustenance. To prevent so great a calamity they make a great offering of cocoa-nuts. On the island of Eap* it is a wizard that causes the Moon to wane, by his enchantments.

We need not be surprised if we find a well-developed worship of spirits among people who pay no worship to the stars. The conception and worship of ghosts and spirits belong to the lowest grades of human development, and are parallel with those phases of fetichism which have all their objects upon the earth itself. More recent than either of these is Star-worship; and to the highest grade of this, which is the climax of fetichism, answers polytheism, the climax of spirit-worship. Where the two intersect, monotheism results. But of course we can only state these points here as theses susceptible of proof.

4. *The Worship of the Stars.*

The Hottentots, who are Moon-worshipers, and who take the Sun to be a lump of fat, have names for several stars, yet do not worship them.† The ancient religion of the Moxos differed for each village. They worshiped severally the Sun, the Moon and the Stars, as well as spirits and fetiches of every description. Their principal objects of worship were the evil spirit Choquigua and the jaguar: yet they kept a festival at the time of the New Moon, and Carasco is inclined to consider Star-worship as their primitive religion.‡ The Abipones of S. America worshiped as fetiches the Pleiades, which for them never set. They regarded this constellation as the founder of their race, and gave to it the same name which they gave to their conjuring doctors, Keebet.§ The Pawnee Indians used to offer human sacrifice annually to the "great star" which they worshiped, viz., Venus; and the same planet had a chapel dedicated in its honor among the Mexicans, who held it to be more ancient than the Sun. The last sacrifice offered to the "Great Star" by the Pawnees was offered in 1837 or 1838. Then a Sioux girl was the victim, and she, after having been carefully tended and well fed, without any intimation of her fate being given her, was bound fast upon a funeral pile and shot to death with arrows. Whilst yet she lived, they carved pieces of flesh off her body, and suffered her blood to flow over the young shoots of corn.*

5. *The Transition to Sun-Worship.*

Wherever the Moon and the Stars are objects of worship, the Sun's claims to adoration will soon be recognized, and then the Sun and the Moon will at first receive equal veneration, to the prejudice of the stars, which will hold but a subordinate position. But when once attention has been directed to the Sun, it will quickly be seen that, as compared with the Moon, he is the superior Being, and then their mutual relations will be reversed, the Sun coming prominently into the foreground. Hence in the worship of Sun and Moon, we recognize two stages: in the one these two luminaries jointly receive equal worship; in the other they are both worshiped indeed, but still the Sun far outranks the Moon, and the religious halo surrounding the latter is as pale as her beams. For all these stages we can find representatives, and of the latter it is to be observed that their intellectual advancement will correspond with the progress they have made in the worship of the heavenly bodies.

The Comanche Indians† worship the Sun and Moon *ex æquo*. They call the Sun the God of Day, the Moon the God of Night, and the Earth, the Common Mother of all.

* Gerland *apud* Waitz, V. 2, 147.
† Campbell, First voyage.
‡ Waitz, III. 538.
§ Dobrizhofer, II, 80, 87 seqq. 317.

* De Smet; J. Irving, Indian sketches. Lond. 1835; Schoolcraft, IV. 50, V. 77.
† Waitz, IV. 213, ff.

In their view the Sun and the Moon are both *men:* they stand on terms of equality, not of subordination, which latter would not be the case were they regarded as Man and Woman. The savage considers woman to be immeasurably the inferior of man, and in the earlier stages of the worship of Sun and Moon the latter would be male, the former female. In that stage which the Comanches have reached they are both male: and it is only later that the Sun is held to be a man, the Moon a woman. As for the intellectual culture of these savages, it may be estimated from the following circumstances. On journeys they direct their course by the Polar Star. They do not follow agriculture, living solely by the chase. Their clothing is of tanned deer-skin. Their weapons are bows and arrows, the lasso and the shield, and now muskets. Each individual is allowed unrestricted freedom of action, but yet offenses are punished by decree of a council summoned annually by the chief. Debauchery is common, and polygamy prevails amongst them. They have no word meaning *virgin*, and it is simple politeness to offer to the stranger a female companion.

On the stage next above this, both Sun and Moon are also worshiped, but the Sun has precedence of the Moon, the latter being female, the former male. The Muzos say the Sun is their Father, the Moon their Mother. The natives of Cumana, one of the Caribees, used to worship Sun and Moon as man and wife.* The Sun goes on increasing in importance: thus the Potowatomies † hold the Moon to be an evil female deity (*supra*, p. 93); the Sun-worshiping Winnebagoes ‡ do not believe that the Moon has any power over mankind; while the Osages regard the Sun as the Great Spirit, ruling over Moon and Earth.* Here we reach that stage in the worship of the heavenly bodies, where the Sun assumes the unchallenged pre-eminence.

6. *The Worship of the Sun.*

Almost all the tribes of American Indians worship the Sun as the Supreme Deity. In North America, according to Waitz (III. 180) this is true as regards all the tribes as far west as the Crows and the Blackfeet, and as far north as the Ottawas. In Florida the worship of the Sun reigned, and it extended thence to the Apache country. Sun-worship, however, reached its highest stage of development in Middle and South America, among the Mexicans and the Peruvians.

The Indians of Florida prayed to the Sun, whom they held to be a man, for victory in battle, and sang hymns of praise in his honor.† The chief offering made to the Sun by the Indians is tobacco-smoke from the pipe, and thus smoking is among them a religious rite. The Hurons, Mandans, Menitarees and other tribes held the tobacco-pipe, whose high importance as the pipe of peace is well known, to be the gift of the Sun: and they, as well as many tribes lying further south, offer this incense to the Sun, to the four cardinal points of the heavens, and to Mother Earth.‡ The chiefs of the Hudson's Bay Indians used to direct three puffs of smoke toward the rising Sun, and greet him with a reverential salutation.§ In the Council, the pipe is always passed around, following thus the Sun's course, as they say.‖ In Virginia, the aborigines used to crouch at sunrise and sunset, and direct their

* Gomara, 208; Herrera, Descripcion de las Indias occidentales. Madrid, 1730, III. 4. 10 seq.

† Keating, I. 216.

‡ Schoolcraft, IV. 240.

* Morse, Rep. to Sec. of War, on Ind. Affairs. New Haven, 1822, Appendix, 229.

† Landonnière, Histoire notable de la Floride (1562–67). Par. 1853, 8, 99; Herrera, VII. 1, 15, 2, 6; Buschmann *ap.* Abhandl. d. Akad. d. Wiss. zu Berl. 1854, S. 300.

‡ Lafitau, II. 134 seqq.; Lettr. édif. I. 763; Nuttall, 274; Keating, I. 408 *et alibi.*

§ De la Potherie, I. 121, 131, II. 106.

‖ Perrin du Lac, I. 179.

eyes and their hands toward that luminary.* The Osages † each morning pronounce a prayer to the Sun, and in the chants of the Algonquin prophets ‡ the Sun is honored as supreme Deity. The Potowatomies § used occasionally to get upon the roofs of their huts at the rising of the Sun and on bended knees make an offering to him of maize gruel. The Spokans call themselves "Sons of the Sun." We can estimate the intellectual status of these Indians from the grade of religious development which they have reached; and the notable researches made by Waitz show that the former is on the whole considerably higher than has been commonly supposed. The nearer we approach to Mexico, the higher is the development of Sun-worship, and the higher the intellectual status of the aborigines. Even the natives of the lower Colorado country,‖ who were Sun-worshipers, did not practice polygamy, jealously watched over the chastity of the young women previous to marriage, and were of mild manners, though warlike. The Pueblos,¶ dwelling in the N. E. part of New Mexico, whose chief god is the Sun, are very industrious farmers with well-constructed implements of husbandry; weave woolen and cotton fabrics; are well clothed, and build houses of stone and adobes, three or four stories in height. As well in geographical position as in culture and worship the Mexicans had for neighbors the Natchez of Louisiana, together with the kindred people of Texas, whose principal tribe was that of the Assinais.** Waitz says that among these is to be found "the truest and most definite expression of Sun-worship, in conjunction with a theocratic form of government." The Natchez lived under an absolute monarchy, and the royal family, descendants of the Sun, stood high above the common people, like the family of the Incas of Peru.

American Sun-worship found its highest development among the Mexicans and Peruvians. These races at the period of their coming in contact with Europeans were no longer savages, but civilized nations in the strict sense of the word, and capable of still further native development. This civilization would have produced the fairest fruit had it not been ruthlessly interrupted by the fanatic zeal of a Cortez and a Pizarro, and later purposely, persistently and violently stamped out by the barbarities of Christian tyrants.

Although polytheism was fully developed among the Mexicans,* still the Sun was their Supreme Deity, especially among the Toltecs, who were the authors of all Mexican culture. It has occasioned surprise to many to find polytheism and Sun-worship co-existent, as in the religion of Mexico. One explanation accounts for this by supposing that this religion had its origin among several diverse nations who coalesced into one, each importing its own religious ideas. But this supposition cannot be established on historical grounds, nor is it at all necessary. We have already more than once remarked that the worship of spirits and the worship of material objects are developed simultaneously and side-by-side. The one *never* arises alone, and unaccompanied by the other. The development of spirit-worship advances *pari passu* with that of matter-worship. Wherever the latter as-

* Strachey, Hist. of Trav. into Virginia Britannia. Lond. 1849, p. 93.

† Nuttall, 95.

‡ Schoolcraft, I. 399.

§ Journal étranger, 1762, Mai p. 7, *ap.* Waitz, III. 182.

‖ Castañeda, Relation du Voy. de Cibola (1540), éd. Ternaux. Par. 1838, p. 299 seqq.; Herrera, VI. 9, 14.

¶ Rivera, Diario y Derrotero de la Visita general de los Presidios de N. España. Guatemala, 1736; Villa-Señor, Teatro Americano, Descr. gen. de los Reynos y Provinc. de la N. España. Mex. 1746. *Cf.* Waitz, IV. 227.

** Waitz, III. 219 ff.

* *Cf.* Prescott, Conq. Mex. I.; Waitz, IV. S. 1–180; Wuttke, Gesch. d. Heidenth. S. 251–299; D. Fr. Saverio Clavigero, Hist. Antig. de Megico, sacada de los mejores historiadores españoles y de los manuscritos y de las pinturas indias, etc. Londres, 1826.

sumes the form of Sun-worship, the former becomes a complex polytheism; hence we find in the religion of Mexico not two incongruous elements, but rather the regular combination of two lines of objects of worship which constitute the inception of religious development in the mind of man. We have no need, therefore, of supposing that the Mexican religion came from different peoples: its two phases are rather the genuine products of the Mexican understanding itself.

The Sun's preëminence over the other gods is shown in the Mexican myth which traced the origin of the Sun, as also in the fact that the Mexicans called themselves "the Sun's children." This myth is given in full by Clavigero,* but we need here refer only to that portion which speaks of the heroes or demigods (heroes o semidioses), who, prior to the appearance of the Sun, ruled over men, and opposed that god when he began to run his course; but seeing that they could not make head against him, such of them as had not already been slain by the Sun made away with themselves, leaving him sole master. Quetzalcoatl, a sort of Mexican Christ,† is said to have been created by the breath of Tonacateotl, the Sun.‡ Whereas offerings were made to the other gods only four times a day, in the morning, at noon, in the evening and at midnight, there were nine daily offerings to the sun, four by day and five through the night, of copal or other fragrant gum, such as chapopotli § (called by Clavigero betun judaico, asphaltum). They offered also quails to the Sun at his rising, and solemnly greeted his appearance with music.‖ That their conception of the Sun was anthropopathic though a most exalted one we see from all their myths. At the solemn naming of the new-born infant, when ceremonies were used having a strange resemblance to those accompanying the baptismal rite in Christian churches—as, for instance, their sprinkling the babe with water and then entreating the deity "that he would cause these holy drops of water to wash away the sin which became the infant's heritage before the creation of the world, to the end that the babe might be born anew"*—the mother thus addressed the Sun and the Earth: "Thou Sun, Father of all that live, and thou Earth, our Mother, take ye this child and guard it as your son."† They often employed this solemn form of asseveration, "By the life of the Sun and of our Lady, the Earth."

The Mexicans, who thus paid supreme honor to the Sun, and made him the object of constant observation, gained an astonishing degree of accuracy in their knowledge of his course. All who have studied the matter are agreed ‡ that the Mexicans, who used sun-dials, calculated the length of the solar year with the utmost possible exactitude. First, their year consisted of 18 months having 20 days each—360 days. To the last month they added 5 days, which they called *nemontemi*, unemployed, as they did nothing on those days but pay visits.§ "But what is most wonderful in their reckonings, and what will appear scarce credible to those who are unacquainted with Mexican antiquities, is this," says Clavigero,‖ "that the difference of some hours between the civil and the solar years was noted by them, and that they resorted to intercalation to equalize them. There was, however,

* Lib. VI. p. 228, Apoteosis del Sol y de la Luna.

† *Cf.* Waitz, IV. 141 f.

‡ Kingsborough, Antiq. of Mex. Lond., 1831, V. 135, 184.

§ Clavigero, VI. 251: Al sol incensaban nueve veces, cuatro de dia y cinco de noche.

‖ *Ib.*, p. 260.

* *Vide* Prescott, I.

† Clavigero, p. 290: Tú, sol, decia la partera, padre de todos los vivientes, y tú, tierra, nuestra madre, acoged á este nino y protegedlo como á hijo vuestro.

‡ *Cf.* Prescott, I.; Waitz, IV. 174.

§ Gama, Descripcion Historica y Cronologica de los Dos Piedras. Mejico, 1832, II. 111 seqq.

‖ Libro, VI. p. 269.

between their mode of intercalation and that of Julius Cæsar which is adopted for the Roman Calendar, this difference, that instead of intercalating one day every fourth year, they added 13 days every fifty-second year. "They waited," says Prescott, "till the expiration of 52 years, when they interposed 13 days, or rather 12 days and a half, this being the number that had fallen in arrear. Had they inserted 13, it would have been too much, since the annual excess over 365 is about 11 minutes less than 6 hours. But as their calendar, at the time of the Conquest, was found to correspond with the European (making allowance for the subsequent Gregorian reform), they would seem to have adopted the shorter period of 12 days and a half, which brought them within an almost inappreciable fraction, to the exact length of the solar year, as established by the most accurate observations. (*Cf.* La Place; *Exposition*, p. 350.) Indeed, the intercalation of 25 days in every 104 years, shows a nicer adjustment of civil to solar time than is presented by any European calendar; since more than 5 centuries must elapse, before the loss of an entire day.* Such was the astonishing precision displayed by the Aztecs, or, perhaps, by their more polished Toltec predecessors, in these computations, so difficult as to have baffled, till a comparatively recent period, the most enlightened nations of Christendom!"

In addition to their solar year they had also a sacerdotal, or, so to speak, an ecclesiastical year of 20 times 13 days, and this year was called the Metzlapohualli (Lunar Reckoning), as distinguished from the civil year Tonalpohualli (Solar Reckoning).† This religious computation of time, which served to regulate the festivals, as also the circumstance that one word, Metzli, served to express both *month* and *moon*, are evidences of an earlier computation by Moons, which in fact Echevarria asserts to have been their more ancient mode of reckoning.*

But even as the Moon lost importance for computing time, so too did her worship decline. She came to be regarded as the wife of the Sun, as the Stars were his sisters.† As for her eclipses, the true cause of which they very probably recognized,‡ they were not regarded with the same emotions as by savages.§ Amid the countless temples and chapels of Mexico two were specially famous, the great temple of the Sun, and the smaller temple of the Moon at Teotihuacan, and around each of these stood a cluster of minor temples, probably dedicated to the worship of the Stars.‖ The planet Venus had a temple called Ilhuicatitlan.¶ The Stars were objects especially of astrological observation, and were consulted with regard to the most trifling domestic affairs as well as the weightiest concerns of the State;** even the kings were attentive observers of the stars, and one of them, Nezahualcoiotl, built for his own use an observatory.

The Mexican State was a carefully articulated organism, down even to its minutest subdivisions. The affairs of the army, the revenues, the courts of justice, the police, etc., were thoroughly organized. The king, vicegerent of God on earth, was possessed of powers limited only by divine authority and the prescriptions of religion. The prayers addressed by him to the deity, to obtain strength and light for the discharge of his important duties, sound like some of David's Psalms.

* Gama, parte 1, p. 23. El corto exceso de 4 hor. 38 min. 40 seg., que hay de mas de los 25 dias en el periodo de 104 años, no puede componer un dia entero, hasta que pasen mas de cinco de estos periodos máximos ó 538 años.

† *Cf.* Waitz, IV. 174.

* De Echevarria y Veitia, Hist. del Origen de las Gentes que poblaron la N. España (Ap. Kingsborough, VIII.) I. 4.

† *Cf.* Waitz, IV. 154.

‡ Humboldt, Vues des Cordillères, 282; Prescott, I.

§ Kingsborough, V. 156.

‖ Clavigero, I. 247 seq.

¶ Clavigero, p. 244.

** *Ibid.* I. 209 seqq. 271, 291, etc.

No Jewish prophet could use more impressive language than this, addressed to a Mexican King:* "Graciously and meekly receive all who come to you in anguish and distress; neither speak nor act from passion. Calmly and patiently listen to the complaints and reports that are brought to you. Silence not the speaker, for you are God's image, and his representative: he dwells in you, using you as the organ (flute) through which he speaks; and he hears through your ears. Punish no man without cause, for the right of inflicting punishment, which you hold, is of God:—it is as it were the talons and the teeth of God, to execute justice. Be just, and let who will be offended; for such is God's decree. Be it your care that in the tribunals all things be done according to order, and without precipitancy, and nothing in passion. Let it never enter your heart, to say, I am Master, and will do as I please; for that would tend to destroy your power, lower you in men's esteem, and impair your royal majesty. Suffer not your power and dignity to be to you the occasion of pride and arrogance, but let them rather remind you of the lowliness from which you have been raised, without any merit of yours. Be not given to sleep, nor to indolence and sensuality, nor to reveling. Squander not the sweat and the toil of your subjects. The favor which God has shown you, abuse not for profane and senseless purposes. Our Lord and King! God has his eye upon the rulers of States, and when they commit a fault, he laughs in scorn, but is silent: for he is God, and does what he will, and derides whom he will: for he holds us in his hand, tosses us from side to side, laughing at us when we totter and fall."

The material progress of the Mexican nation may be judged by the number and size of the cities. The city of Mexico had from fifty to sixty thousand families, or *houses*, as some authors suppose; Tezcuco was of equal magnitude; Tzimpantzinco had 20,000; Cholula, Huexocinco and Tepeaca, each 40,000; Xochimilco 80,000; According to Cortez himself Tlascala was in every respect a more opulent place than Granada in Spain. These cities all possessed buildings of considerable magnificence, and there were besides a number of smaller cities.*

The earnestness of their moral sentiments is evinced by the rigid discipline enforced as well in their domestic education as in that of their schools and seminaries, and by the exhortations, the prayers and the proverbs which were learned by rote. "Nothing," says Padre Acosta, "astonished me more or appeared to me more praiseworthy and notable, than the system followed by the Mexicans in the education of their children." "In truth it were difficult to find a nation," adds Clavigero, "that bestows more diligent care than they upon a matter which so nearly concerns the well-being of the state. Doubtless," he continues, "they disfigured their teaching with superstitions; but still the zeal they showed for education might well put to shame many a father of a family in Europe: and many of the instructions which they gave to the pupils would make profitable reading for our own young people." †

As a specimen of these I give the exhortation addressed by a Mexican to his son, which is admitted to be genuine by all the critics: ‡ "My son, you came forth out of your mother's

* Sahagun, *ap.* Waitz, IV. 68.

* *Cf.* Waitz, IV. 93.

† Clavigero, I. 299.

‡ I translate it from Clavigero's work (*ubi supra*). He says it came to his hands from those of Motolinia, Olmos and Sahagun, missionaries in Mexico, perfect masters of the language, and zealous students of Mexican manners, etc. Besides this address of the father to his son, Clavigero gives a similar address of the mother to her daughter, to be found in Prescott (Append. II.), and which is even a more charming composition than the address given in the text. (See the latter also in Waitz, IV. 125, who takes it from Sahagun, Hist. de N. España, VI. 18.)

womb as the chick from the egg, and as you grow you are like the chick preparing for your flight over the earth, nor is it given us to know how long Heaven will insure to us the jewel which we possess in you. However that may be, be it your care to lead a correct life, praying unceasingly to God for his support. It was he that created you, and he is your owner. He is your Father, and loves you more than I. Turn your thoughts God-ward, and let your aspirations rise to him by day and by night. Honor and greet those who are older than yourself, and never give them tokens of contempt. Be not deaf for the poor and the unfortunate, but rather make haste to console them with kindly words. Pay respect to all men, especially your parents, to whom you owe obedience, reverence and dutiful service. Have a care never to follow the examples of those wayward boys, who are like wild beasts void of reason, and who do not respect those who have given them their being, nor heed their admonitions, nor submit to correction: for whoso walks his own ways will come to a disastrous end, dying in blank despair: he will either be hurled down a precipice, or will fall under the claws of wild beasts. Make not merry, my son, over the aged, nor over those who have any bodily defect. Mock not those who happen to make a misstep, nor reproach them therewith; on the contrary be humble, and fear lest what offends you in others become your own. Go not whither you are not invited, nor meddle in affairs which are none of yours. In all that you say, and in all that you do, be it your study to show your good breeding. When you converse with any one, do not annoy him with your hands (mit den Händen belästigen) nor be too voluble: do not interrupt or disturb others with your remarks. If perchance you hear a man speaking foolishly, and it is not your business to correct him, hold your peace: but if it is your business, then consider first what you will say, and speak not arrogantly, that your corrections may avail the more. When any man addresses you, listen to him attentively and with proper demeanor, neither shuffling your feet, nor munching your mantle, nor spitting out, nor jumping up every moment if you are seated: for such conduct shows levity and bad breeding. When you are seated at table, eat not ravenously, nor betray signs of displeasure, if any dish fails to please you. If any one comes in while you are at table share with him what you have, and when one sits at your board, fix not your gaze upon him. When you go out, keep your eyes directed forward lest you hustle against those you meet. When any one approaches you, walking on the same path, give place a little that he may have room to pass. Never walk in advance of your superiors, except when necessity requires that you should, or they command it. When you eat in company with them, serve them with whatever they wish, and so you will gain their favor. If a man make you a gift, receive it with tokens of gratitude: if the gift is of great value, be not vain of it: if it is trifling, do not despise it, nor grow angry, nor anger the man who does you a friendly act. If you are rich, be not supercilious toward the poor and the needy: for the gods who refused riches to others in order to bestow them on you, disgusted at your arrogance, may strip you of them, and give them to others. Live by the fruits of your labor, and then your bread will taste sweet. Hitherto, my son, I have supported you with the sweat of my brow and I have discharged all the duties of a father; I have given you the necessaries of life, without wronging any man. Do you the same. Never tell a lie, for lying is a grievous sin. Whenever you recount to another what you yourself have heard, then tell the simple truth without adding anything. Speak not evil of any man. Conceal the misconduct of others, unless it be your duty to mend it. Avoid gossiping, sow not the seeds of discord. If you are the

bearer of a message to any one, and he grows angry, and he vituperates the sender of the message, do not take back that reply, but strive rather to deprive it of its harshness, and if possible say not a word of what you have heard so that there may not be dissensions and disagreements, which you could only regret. Tarry not in the market-place longer than is needful, for such places afford frequent temptations to debauchery. If an office is tendered you, regard the offer as made with a view to test you: therefore do not accept at once, even though you know you are more capable than others; but excuse yourself, until they oblige you to accept: thus you will be all the more esteemed. Keep your passions in check, else the gods will be angered with you and cover you with disgrace. Repress your sensual desires, my son, for you are still young; and patiently await the time when the maid, whom the gods have chosen for your wife, shall have reached the required age. Leave such concerns to the care of the gods; they will do what is best for you. When the time comes for you to marry take no step without your parents' consent, else you will meet with an evil end. Steal not, rob not, if you would not disgrace your parents: it is your duty rather to reflect honor upon them and to show that they brought you up properly. That is all, my son; I have discharged my duty as father. It was my purpose to confirm you in good dispositions by this instruction. Do not despise my words: for your happiness through life depends upon your fidelity."

Prescott gives a number of Mexican proverbs,* which, according to him, may compare with any found in the moral codes of antiquity. He discovers in the following admonition "a most striking resemblance to Holy Writ": "Regard not curiously the walk and demeanor of the great, nor of women, especially married women, for the old proverb says: Whoso regards a woman with curiosity, commits adultery with his eyes." * Monogamy was the rule amongst the Mexicans, and in this respect they came up to that moral standard of marriage with which we are familiar. Nor was the idea they had of their gods unworthy of their moral code, and Clavigero, who compares Grecian and Roman Mythology with that of Mexico, thus expresses himself: "There is not to be found anywhere in Mexican Mythology a trace of those immoralities with which other nations have disgraced their gods. The Mexicans paid homage to virtue rather than to vice, in the objects of their religious veneration: in Huitzilapochli they honored valor; in Centeotl and others, benevolence; in Quetzalcoatl, chastity, justice and prudence. Though their gods were of both sexes, still they did not marry them to one another, nor did they attribute to them that love of obscenity with which the Greeks and Romans credited their gods. They represented them as averse to all kind of vicious indulgence and hence their worship was intended merely to appease the wrath of the gods, excited by the sins of mankind, and to secure their protection by repentance and religious service." It is no wonder if so enlightened a religious system as this surprised the Christian priests; and the latter would no doubt have preferred to find it of a lower type. The language of Mexico, rich in metaphysical and moral expressions, opposed no obstacle to the teaching of the Christian Doctrine, and Clavigero gives specimens of the writings of 84 European and Creole authors "who treated of Christian Doctrine and morals in the languages of Anahuac," as also a list of 49 Autores de Gramaticas y

* Vol. I.

* Sahagun, VI. 22. Tampoco mires con curiosidad el gesto y disposicion de la gente principal, mayormente de las mugeres, y sobre todo de las casadas, porque dice el refran, que él que curiosamente mira à la muger adultera con la vista.

Diccionarios de las lenguas de Anahuac.*

King Nezahualcoiotl endeavored to do away with the human sacrifices which were so frequent in Mexico, but without success, and the attempt only served to show him how difficult it is to convince the people of the falsity of ancient religious notions which have taken root in their affections. We may justly reproach the Mexicans with their religious fanaticism as displayed in these sacrifices: but we must not charge them with inhuman cruelty. In fact no action is *per se* either good or evil, but owes its moral quality to the motive which prompts it: and the same is to be said of human sacrifice. The Mexicans offered to the gods the most precious goods they possessed, *viz.*, themselves, human beings. No animal could suffice, and man alone was the becoming victim to atone for sin. And is not the profoundest teaching of Christianity based on that last and greatest human sacrifice? Hence the motive which led them to offer human victims was the profound earnestness of their religious convictions. Besides, as the Mexicans sacrificed only condemned criminals and prisoners of war, Montezuma could with some show of reason excuse this custom, as he did, by saying to Cortez: "We have the right, as you also have, of slaying our foes in battle. Where, then, is the injustice if we sacrifice in honor of our gods men already doomed to death?" †

That we should find remnants of the lower grades of fetichism in company with the worship of the Sun and of Gods, was to be expected. The Mexicans appear to have been largely given to Animal-fetichism. It included the frog, the God of fishery, as also the butterfly and other insects.‡ A grave containing the bones of some unknown animal, was found in 1790, and in it was also discovered the famous Calendar-Stone.*

Oajaca, Chiapas, Yucatan, Guatemala and Nicaragua † stand on the same level with Mexico, as regards religion and culture. The Peruvians, who were the equals of the Mexicans in intellectual and material advancement, surpassed them perhaps in moral culture.‡

Although the Peruvians, no less than the Mexicans, worshiped a multitude of gods § they too held the Sun to be supreme, none of the other gods coming near him in sanctity or eminence, except perhaps Pachacamac. Previous to the Inca period the Peruvians were by no means such savages as they are represented to have been by Garcilasso, who attributes to them all kinds of fetichism, and who asserts that Sun-worship was introduced by the Incas. On the contrary, the Sun was worshiped in Peru, before the time of the Incas, having been introduced by the Aymaras, "the predecessors and teachers of the Inca-Peruvians."‖ But the Incas, to whose family Garcilasso belonged, had an interest in ascribing to themselves the honor of having been the founders of the State and of the religion of Peru. The story which they told in confirmation of their claim is characteristic.¶ "The Sun, our Father, seeing the pitiable condition of mankind, was moved to compassion and sent to them from heaven two of his children, a son and a daughter, to teach them how to do him honor, and pay him divine worship. These two children of the Sun were further charged to give laws to men, and to direct them how to live like rational creatures, to acquire culture, to dwell in houses, to inhabit cities, till the soil, cultivate plants, save the harvest, breed cattle, enjoy

* Clavigero, II. 394.

† Clavigero, Tom. II. Append. VIII.

‡ Riétos Antiguos, Sacrificios e Idolatrias de los Ind. de la N. Esp. p. un frayle menor (1541) (ap. Kingsborough, IX.) 21; Gomara, 444.

* Gama, I. 12.

† *Cf.* Waitz, IV. 312.

‡ Prescott, Conq. of Peru, I. Book 1; Wuttke, Gesch. d. H. I. S. 303-336; Waitz, IV. 378–477; Garcilasso de la Vega, Hist. Gen. del Peru. Cordova, 1617.

§ *Cf.* Waitz, IV. 452 seqq.

‖ Waitz, IV. 447.

¶ Garcilasso, I. c. XV. XVI.

the benefits derived from all these sources, prepare the products of the soil for food: in a word, their mission was to teach the people how to live like men, rather than like wild beasts. It having pleased the Sun, our Father, to give his children such commands as these, he let them down upon the earth in the neighborhood of Lake Titicaca, bidding them to go whithersoever they would. They were however instructed to drive into the earth a golden staff wherever they thought of establishing their residence in any particular spot: if the staff on the first blow sank into the earth, it was the will of the Sun, our Father, that they should settle there. On coming to the spot where Cuzco was afterwards founded, the sign which had been foretold was given to them. The savages soon began to flock around them, gazing with wonder on the pair, who were arrayed in the precious apparel of the Sun, and who, no less by their speech than by the majesty of their countenance, gave evidence that they were the children of the Sun. Then the Inca instructed the men in all needful arts, such as house-building and agriculture; while his sister and spouse gave instruction to the women in all kinds of feminine work, such as needlework, and the weaving of cotton and woolen cloth, the making of garments, etc. Furthermore, they both taught the natives the worship of the Sun, their Father."

Thus the Sun was worshiped, and we have now to ascertain in what light they regarded this object of religious veneration. Man can attribute to any object only those notions which he already possesses. The higher then his development, in an intellectual and in a moral sense, the nobler will be the conception he has of the object which he takes for his supreme ideal. The Peruvian will regard the Sun as combining all those virtues and properties which he has himself.

They were an industrious and an ingenious people. Agriculture formed the basis of the commonwealth, and was pursued with the greatest diligence and skill. No spot of ground was untilled, maize and potatoes being the chief products of the soil.* Even the stony sides of the mountains were turned into blooming gardens, by means of terracing, artificial irrigation and the use of guano as manure. They produced excellent cotton and woolen fabrics, and their metal manufactures, in gold, silver, copper and tin (they had no iron) bore the stamp of skillful workmanship. Every part of the country was connected with Cuzco, the capital, by means of excellent highways, some paved, others macadamized,† having well-constructed bridges, a service of posts and a sort of telegraphic system. The latter enabled them to send dispatches a distance of 900 miles in three or four hours.‡ Cuzco had a population of 200,000 souls, exclusive of an equal number dwelling in its suburbs. The other cities were smaller, and yet had a considerable population.§ By means of a division of the population into decads the most exemplary order was maintained.‖ The entire population formed one family, the Inca being its head. All labored and earned for the good of all. The state, not the individual, was an owner of property. Hence none were rich, but also none were poor. The contrast between proprietors and non-proprietors was done away, and all enjoyed prosperity. There were neither beggars nor drones.¶ The citizen's obligation to labor was correlative with that of the state, which owned his labor and its total product, to reward him for his toil. Under the guardian rule of the Incas, whose duties were prescribed to them by the Sun their Father, and who but rarely, as history attests, failed to exercise a paternal care for the commonwealth, the people lived in peace and happiness. Each conquered nation were

* Prescott, I.
† Waitz, IV. 429.
‡ Garcilasso, VI. c. 7; Wuttke, I. 334.
§ *Cf.* Waitz, IV. 424.
‖ Prescott, I.
¶ *Ib.* I.

immediately allowed to share the rights and privileges of their conquerors. Indeed, it was the desire to extend civilization that led them to undertake wars of conquest.*

It is evident that such a constitution of the empire must have had many defects, and that it hindered individual development, as well as favored the abuse of power by a tyrannical Inca. It was for the interest of the Incas to keep the people in subjection, and hence they cut them off too jealously from all intellectual culture, the possession of which they reserved for themselves alone.

A state organized on such principle cannot subsist without a morality quite free from selfishness, that root of all evil. Their family-life was chaste and pure; their women were not chattels, as among savages, but persons who, as represented in the virgins of the Sun, held a high position in the ceremonies of religion. Intellectual culture, in the sense of erudition, was restricted to the Inca caste; still the education of the people was a function of the state. The picture-writing of the Mexicans was here replaced by that curious contrivance, the quipu,† which was employed by many scholars, and also, but in a less degree, by the people generally. Garcilasso speaks of maps of the whole country and of particular districts and of charts of cities. The learned class did not, as in Mexico, belong exclusively to the priesthood, and they were classed as astrologers, physicians, botanists, poets, designers, painters, etc.‡ The Quechua, like the Mexican language, contained a number of very abstract terms, such as *spirit*, *thought*, *eternal*, etc., which will enable us to form some notion of the degree of mental development attained by this people.§

As to the Peruvian mode of reckoning time we have not the same accurate information as we have with regard to that of the Mexicans. Humboldt* says that the year was made up of 12 lunar months, giving a total of 354d. 8h. 48m.; and according to Rivero and Tschudi,† 11 intercalary days were added at the end of each year, but according to Herrera ‡ there were 12 intercalary days, one being added at the end of each month. In the face of these statements Desjardins § maintains that the Peruvian computation was more exact than the Mexican, and Montesinos ‖ speaks of very precise intercalations, and of cycles of 10, of 100 and 1000 years. But Waitz has strong doubts as to these statements.

Prescott ranks the Peruvians above the Mexicans for skillful workmanship in house-building, tillage, and the construction of roads and canals. Their inferiority to the Mexicans in intellectual culture—for instance, in astronomy—he strives to explain by showing that the Mexicans owed their intellectual advancement, not to their own native qualities, but to that mysterious Toltec stock, which the eye of history fails to discern, and which Prescott supposes to have been equaled by the Peruvians in all other departments of culture.¶

Among a people, who have reached so high a degree of moral and intellectual development, the ideal object of worship must exhibit these moral characteristics in the highest degree. And such is here the case, for the Peruvians regarded the Sun "on the one hand, according to his position in Nature, as the great Power of the universe which upholds all things (a mere heavenly body); but on the other hand (anthropopathically) as a spiritual power, having mind and will. Not that there was supposed to be any spiritual object whose symbol

* *Ib.* I.
† *Cf.* Waitz, IV. 470.
‡ *Ib.* 473.
§ *Ib.*

* Vues des Cordillères, 129.
† Riv. y Tschudi, Antig. Peruanas. Viena, 1851, p. 127.
‡ Herrera, V. 4, 5.
§ Desj. Le Pérou avant la Conq. Espagn. Par. 1858, p. 122.
‖ *Ap.* Waitz, IV. 474.
¶ Prescott, Peru, I.

was the Sun (*i.e.*, the object of worship was not a spirit inhabiting the Sun); but the bright luminary itself (in his own proper form and shape) was truly and really the deity, though not as a simple, soulless sphere, but as a divine and animated body, imparting to all things around him light and life." * When once a monk expounded the Christian doctrine to the Inca Atahuallpa, and asked him to renounce his faith, the eyes of the prince flashed fire, and he exclaimed: "I will never change my faith. Your God was, as you say, put to death by the men he himself had created. But my God," said he, pointing to the Sun which was then setting in full splendor behind the mountains, "my God lives in the heavens, and looks down upon his children." † When the Sun sent his children down upon the earth he thus addressed them: "My children, when you have subjected these people to our obedience, it must be your study to hold them by the laws of reason, of piety, of mercy and of justice, doing for them all that a father is wont to do for the children whom he has begotten and whom he tenderly loves. Herein you will follow my example, for, as you know, I never cease to do good to all mortals. I illumine them with my light, to the end they may see and go about their affairs: when they are cold, I warm them; I make their fields and their meadows productive, bring forth fruit on their trees, increase their herds and send them rain and fair weather as need may be. Further, I journey around the world daily, to see what the earth needs, and to restore all things to order, for the comfort of its inhabitants. Therefore it is my will that ye follow my example, as most dear children, whom I send on earth for the welfare and the instruction of these poor men, who live like beasts. Hence I give you the title of kings, and I desire that your kingdom be extended over all the nations whom ye shall instruct in right principles and good morals, especially by your example and mild rule." * Through reverence for the Sun, even the Inca durst not look upon its face.†

The offerings made to the Sun consisted, besides the morning prayer, at his rising, of a libation (as among the Persians); then of fruits, herbs, flowers and animals, llamas especially.‡ Garcilasso expressly denies that they offered human sacrifices, and often mentions the laws which forbade the sacrifice of captives: still other accounts render it tolerably certain that on high festivals they sacrificed a child or a beautiful maiden.

Where Sun-worship is so highly developed, the worship of the other heavenly bodies holds a very subordinate position. They worshiped the Moon as the Sun's sister and spouse, and the stars (among which Venus and the Pleiades were specially observed) § were considered as their *suite*.‖ The most famous temple in Peru was that of the Sun, at Cuzco, which, on account of its fabulously rich endowments, was called Coricancha—Place of Gold;¶ and the temple next in renown was that of Pachacamac, also at Cuzco. The Temple of the Sun included a chapel plated all over with silver, and dedicated to the Moon, as also three other chapels, richly plated with gold and silver, and sacred to the Stars, to Thunder and Lightning, and to the Rainbow.

With the Peruvians we may class, from the religious point of view, first the Araucanians,** who dwell to the south, in Chile, and who reckoned a solar year of 12 months, each month having 30 days, and five days being intercalated through the year. They were able to determine the time of

* Wuttke, I. 306 seq.
† Prescott, I. 3.

* Garcilasso, I. lib. I. c. XV.
† *Ib.* IX. c. X.
‡ *Ib.* II. c. VIII.
§ *Cf.* Waitz, IV. 475.
‖ Prescott, I.
¶ *Ib.*
** *Cf.* Waitz, III. 515 ff.

the solstices from the length of shadows. Then came a very advanced people, of higher culture than the Araucanians, viz., the Chibchas,* and their kinsmen, living in New Granada, a country whose antiquities bespeak for its inhabitants a relatively high degree of culture in very early times. Among the Chibchas the Sun held the same important position as among the Peruvians. There is no evidence to show that they imported from Peru their religion and their intellectual culture, but rather everything tends to prove that their development was of native growth.

7. *The Worship of the Heavens.*

In the view taken of the heavens by all men on the basis of the external appearances, the heavenly bodies pass for bright points fixed in the blue vault of the sky, rather than for spheres free-poised in infinite space. Sun, moon and stars are only parts of the celestial vault. Hence, howsoever they may differ from one another, still essentially they are of equal value, being all celestial. The supremacy therefore does not belong to this or to that one body, but to the entire firmament. It is therefore really no new standpoint, but rather the sum of the data already obtained, if now the religious consciousness considers no longer the sun, the moon, or the stars, but the sum-total of them all, the celestial vault, the sky itself, as the supreme fetich, the supreme god. And here too, as in all the objects of fetich-worship, it is the vault of heaven, as such, anthropopathically apprehended, and not any god supposed to be symbolized by it, that receives religious honors. But this worship of the entire heavens does by no means interfere with the worship of the individual heavenly bodies, but rather, on the contrary, favors it. Sun, moon and stars may each receive its peculiar worship and sacrifice; but no one of them has the absolute ascendency.

That the people who stand on this stage of fetichism are, from a mental and moral point of view, very advanced, follows from what has been already said. As representatives of this stage we might cite the Persians, as described by Herodotus; also the Chinese.

"To erect statues of the gods, altars and temples," says Herodotus, "is not the custom of the Persians, and indeed they reproach those who do so with folly, and this, as it appears to me, for the reason that they do not believe, as do the Greeks, that the gods are anthropomorphic. On the contrary, they are wont to sacrifice to Zeus on the summits of high mountains, and to invoke the entire celestial vault as Zeus. They also sacrifice to the sun and the moon: to the earth, to fire and to the winds. The Persians have no holocausts, no libations, no meat-offering, no flutes, no garlands, no barley cakes: but whoever would sacrifice to one of these gods puts a crown of myrtle around his tiara, conducts the animal to some place free from pollution, and there prays to the god to whom he is about to make the offering. Still he prays not for himself alone, but prays rather that it may be well with all Persians and with the king. Then the animal is slain, cut up, seethed, and afterward spread upon the green sweet grass; the Magi then chaunt a song of consecration, standing by the side of the one who makes the offering, and the latter finally takes the flesh home, to make such use of it as he may wish. The Persians believe that the gods desire only the soul of the beast as a sacrifice, disdaining the flesh; hence they do not burn the flesh, lest they should pollute the fire, which is sacred to the gods: nay, even one durst not even blow on the fire, to quicken it, for that is an offense that is punished with death. As they make offerings to fire, so too do they to water, betaking themselves to some lake, or river, or fountain, and digging a trench in the vicinity, lest the blood should defile the water. There they

* *Ib.* IV. 532 ff.

slay the victim, and spread the pieces on sprigs of bay or myrtle; the magi, who are present, make libations of oil, milk or honey, and chaunt a sacred song; and the sacrificant takes away the flesh of the victim." This conception of sacrifice, where only the soul of the victim is accepted by the gods, (*gods* as defined by Herodotus himself) shows that the Persians no longer viewed their gods from the gross materialistic point of view, and subordinated the material to the spiritual. Their praying for all Persians and not for themselves individually is evidence that they stood high above the egotism of the savage, who cares only for himself.

As objects of religious contemplation, the sky is regarded as the Father, the Earth the Mother of all things by the Chinese, the religious views of the masses being but little affected by the more philosophical and abstract speculations of their later teachers.* Yang, the Sky, is procreative, strong, masculine; Yu, the Earth, is conceptive, weakly, feminine.† All things are the products of these two. "So soon as Yu and Yang unite, an actual existence results, and this is the work of Heaven and Earth."‡ That this Sky-worship is most intimately connected with Sun-worship, nay, even that it derives its origin from Sun-worship, appears to be beyond question. The Y-King, for instance, says that Yang makes his most perfect apparition in the Sun.§ The movement of Yang, again says the Y-King, is in a circle, being accelerated from the beginning of spring until the solstice, and then retarded. He consists of an extremely subtle matter, invisible to our eyes, but yet most real, and has a fixed and never ceasing circular motion; and his form is spherical, whereas that of the earth is angular, and therefore less capable of motion.*

In the Spring and Summer, when the quickening power of the heavens is greatest, Yang bears sway, but in Autumn and Winter, when the quiescent earth predominates, Yu assumes rule. Yang is lord of the day, culminating at noon, and then gradually yielding to Yu, who rules the night.† All these functions of Yang belong more properly to the Sun than to the Sky.

"Wherever," says Wuttke,‡ "in accordance with our habits of thought, we expect to find mention of God in Chinese writings, it is always the Sky that we find named, sometimes Sky and Earth, but more commonly the Sky alone. And the Sky which is meant is the visible heavens, whose apparent revolution around the earth is held to be the cause of all life and movement. Sun, Moon and Stars are set in this blue Sky, which is the manifestation of deity." Uninfluenced by the nice distinctions which the philosophers of China have made as to the essence of the Heavens the popular mind takes the anthropopathic view, which, however, as was to have been expected of a people so advanced in moral culture as the Chinese, attributes to the Sky only the noblest and sublimest characteristics. They give to the Heavens the name Shang-to, "Sublime Ruler, Supreme Lord."§ He is almighty and omnipresent. His all-embracing love is shown in the saying: "The Sublime Ruler of the Universe is to be feared and reverenced: he hates none. Who durst say that He hates any man?"‖ His justice is not to be bribed, and is as immutable as his celestial movement; great is his wrath against the unjust;¶ from

* *Cf.* Wuttke, Gesch. des H. Bd. II. S. 1–208; Bluntschli, Altasiatische Gottes-u. Weltideen S. 135–164; le Chou-King par Confucius, trad. par P. Gaubil, revu par M. de Guignes. Par. 1770, p. 88–150.

† Y-King, ex Interpr. Regis. Ed. Mohl, 1834, I. p. 165–169, II. p. 381.

‡ *Ib.* II. 547.

§ *Ib.* II. 406.

* *Ib.* II. 385 seq.; I. 203.

† *Ib.* I. 196, 214; Tschu-hi, übersetzt von Neumann, in Illgen's Zeitschr. 1837, Bd. I. 56, 74, 82.

‡ II. S. 25.

§ Chou-King, p. 13, Note 7; Y-King, II. p. 216.

‖ Confucii Chi-King, s. Liber Carminum, ex Lat. P. Lacharme Interpr. Ed. Jul. Mohl. Stuttg. 1830, II. 4, 8.

¶ *Ib.* II. 4, 8; II. 5, 1.

his omniscence naught is hidden.* And these things are all predicative of the blue vault above our heads, *v.g.* "O blue Sky, look down with scorn upon the proud, and have pity on the unfortunate," is a Chinese prayer.† The Sky so considered is man's moral prototype, which he must reproduce in his own life. "His four properties set forth the ideal of a prince: he is so great, that he encompasses all things; so mighty that he creates all things; so orderly that he adapts all things to their ends; so persistent that he never stands still, never ceases to be." ‡ The Sky is the supreme lord. He requires of man perfect righteousness and sinlessness. Being omniscient he knows when a man is guilty of sin. His wrath is enkindled against all injustice, and he manifests it on occasion by celestial phenomena and by the convulsions of Nature, which are thus brought into relations with the moral life of man. Eclipses of Sun and Moon, earthquakes, thunder and lightning and the other grave phenomena of Nature are warnings sent from Heaven to man.§ Crops fail on account of the sins of the people or of their rulers. "When virtue reigns," says Kitse in the 12th century B.C., "the rain falls betimes; when the sovereign rules justly, there is fair weather, etc.; when sin reigns, the rain falls incessantly, or else there is a drought," etc.‖ The guilty are oftentimes punished directly by the Heavens. An emperor of the second dynasty having defiantly shot arrows at the sky, and erected idols was slain by the lightning.¶ For the space of three days did the Heavens envelop the earth in dark clouds, because another emperor had committed a crime.* We might cite a multitude of similar instances; † but as our purpose here is only to define the position of China with regard to religious development, we refrain from any further illustration of this point.

However just the claim of the sky to the undivided worship of man, and howsoever strictly philosophico-religious speculation may show it to be the one object that deserves to be worshiped, still the popular mind will not renounce its own nature as a fecund principle, and so it fashions for itself notions of spirits and gods on purely empiric grounds. Hence in China, besides sky-worship there is a complex system of Spirit-worship and polytheism.‡ In addition to the Ancestral Spirits, which are the principal objects of veneration, there are the Celestial Spirits, which dwell in the heavenly bodies, in the Sun, the Moon, the Stars, the Earth; on mountains, in rivers; in the thunder and in the winds. There are the guardian Spirits of families, of houses, of communities, of cities, of provinces, of agriculture, etc., and we find mention of these even in remote times: yet they rank so far beneath the Sky that by an ancient law it was forbidden to make offerings to them such as were made to the Sky, and it was allowed only to make them gifts of food, and to show them a limited amount of reverence.§

In Africa, too, among the more advanced nations, we find traces of a growing Sun and Sky worship. In Dahomey, a country ruled with barbarous rigor, but yet possessing a well-organized monarchical government, the Sun is held to be the highest of all beings but yet is not worshiped.‖ The Duallas call the Sun and the Great Spirit by one name.¶

* Histoire Générale de la Chine, trad. du Kong-Kien-Kang-Mon par de Mailla, publ. par Grosier. Par. 1777, I. p. 92, 111.
† Chi-King, II. 5, 6.
‡ Wuttke, II. 26.
§ Chou-King, p. 13, 54, 87, 96, 99, 142, 160, 347; Chi-King, p. 291, II. 5, 6, 8; De Mailla, I. 78.
‖ Chou-King, p. 172.
¶ De Mailla, I. 227.

* Chou-King, p. 91.
† *Cf.* Wuttke, II. 55 ff.
‡ *Ib.* II. 36 ff.
§ De Mailla, Hist. gén. I. 33.
‖ Omboni, Viaggi nell' Africa Occidentale. Milano, 1845, p. 309.
¶ Allen and Thomson, Narr. of the Exped. to the R. Niger in 1841. Lond. 1848, II. 199, 395 *note*.

In Acra Römer discovered a sort of worship paid to the Sun.* The Negroes of the Gold Coast, at least their devotees and fetichmen, call Njongmo (the Sky), which is omnipresent and *ab ævo*, the Supreme God, and the Maker of the world.† "You may every day see," said a fetichman, "how the rain and sunshine sent by him cause the grass and grain and trees to grow: he must therefore be the Creator." Every morning they go down to the stream, wash themselves, dash a handful of water or sand on their heads, and with eyes turned to the sky, utter this prayer: "O God, give me this day rice and yams, gold and *agries:* give me slaves, wealth and health, and grant that I be quick and swift." The same belief, substantially, prevails in Akwapim, the Supreme Deity being the firmament, and the Earth, the Universal Mother, holding the second rank, while in the third rank stands Bosumbra, the head Fetich. Before embarking in any new enterprise the people of Akwapim offer a libation to these three, saying: "Creator, come, drink; Earth, come, drink; Bosumbra, come, drink." ‡

CHAPTER VII.

THE AIM OF FETICHISM.

HAVING traced the development of religious ideas from their earliest origin to their more advanced stages, we would now gather the results of our analyses in order to show the ulterior aim to which the system is directed.

1. *Retrospect.*

The understanding has cognizance only of its own conceptions, and these conceptions are its objects. Hence its range is limited to the conceptions and objects it has, and hence too it grows as the number of its objects is increased. If we would appreciate a man's intellectual status, we must know what are his conceptions, his *objects*. In his lowest condition man has but few objects: but as these are multiplied the more, the more does he advance in every respect.

It is a law of our mind that we shall range our conceptions in the order of cause and effect. But we can so range such conceptions as we possess. *Cause*, as being the efficient, the productive principle we can conceive of only as something possessed of power, of special efficiency. Accordingly that object or that conception will pass for causal and efficient, which appears to be the stronger, the more excellent. We have seen how, as the number of objects was greater or less, their values differed proportionally, and how the mind with few objects must set as high a value on trifles (as viewed from a higher standpoint) as a superior understanding sets upon its more important objects: for a relatively trifling object assumes importance when its surroundings are more trifling still than itself. Hence we have seen that because he has but few objects, and a very narrow *world*, the fetichist takes to be causal an object which for him is momentous, though insignificant for us. We have seen that as he increases the number of his conceptions, the number of assignable causes is increased in proportion; and then we considered the various objects regarded as fetiches: stocks, stones, mountains, plants, etc. All these lay in man's own sphere, and he was attached to them by bodily interest. A new and spiritual interest could be awakened only by an entirely new object, and this he found in the heavenly bodies, by the worship of which man stepped beyond simply material interests and entered a spiritual sphere.

In proportion as the spiritual interest increases the more is the will detached from the simply corporeal. Animal passions are repressed in proportion as objects of spiritual interest

* Römer, S. 84.
† Waitz, II. 170.
‡ *Ibidem.*

attract the will to themselves. But in order to devote himself to spiritual interests man had need of repose, tranquillity and bodily security. The higher this spiritual interest rises, the more is fierce and destructive egotism repressed. Life is more tranquil, more orderly. Man builds up commonwealths, and his thoughts are now no longer concerned about himself alone, but about the commonwealth also. But in proportion as he abandons egotism, the more does he acknowledge moral control. In the higher stages of the worship of heavenly bodies we therefore found a high degree of development, not only intellectually but also morally. For morality being will-stimulus, or will-direction, and the will being elevated only by gaining higher and ever higher objects, therefore morality is elevated in proportion to the elevation of the objects.

2. *The New Problem.*

Sky-worship, including Star and Sun-worship, is the highest grade of fetichism, not only because its objects are the most exalted, but also because it contains the nucleus of something altogether new. So far, man has been tracing causes from object to object, and in the pursuit of the final cause at length passed from earth to sky. But even there his final cause was found to belong to the order of sensuous things. His eyes discern his efficient causes; he *sees* them producing all phenomena, all objects. But the law of the mind is that he shall still search for a cause, and when once the mind has begun to question, it will never cease to question. What is the cause of A? it asks: and the answer is, B. But further it will ask, What then of B? and an answer it must have. Now so far it has taken the Stars, the Sun, the Sky for its ultimate cause: but the greater man's reverence for this cause, and the more he contemplates it, the more he learns as to its true nature. Soon all manner of thoughts will spring up, and he will observe contradictions between its actual, empirical phenomena and his own conception thereof, and of the mode in which it must operate. How is this? he will inquire. And when such and such effects are produced by the Sun, the question will come up, But what produced the Sun itself, with its phenomena? And in fact wherever this worship of heavenly bodies attains its highest stage, as among the Mexicans, Peruvians and Persians, this question did actually arise. The Persians not alone put this question, but they found the answer to it, and the result was a new religion, that of Zoroaster. But the Mexicans and the Peruvians had their development interrupted by the fanaticism of a Cortez and a Pizarro, and hence they could not reach a solution of the problem, though it was explicitly stated by some eminent minds among them, and the nation was in a fair way soon to enter on a new religious epoch.

But let us see how the problem must be solved by a people in their stage of development. As long as the objects of sense afforded the grounds for considering them as causes, so long did man ascend the series. But when the last link in that chain is reached, the senses fail; and the eye cannot penetrate beyond the blue vault of the heavens. Hence when he comes to inquire as to the cause of the sky itself, he cannot assign any sensible object, there being none that is greater than this. If therefore he would still pursue his search after a cause, he must needs go beyond the domain of sense, and assign causes not apprehensible to the senses, prætersensual or supersensual. But now he could not assign anything super-sensual as a cause, if he had no conception of the "supersensual." But his gods and spirits have furnished him with such a notion, and he has often held them to be the causes of sundry phenomena in the world of sense. All his conceptions are empirical, and his conception of gods also had an empirical

origin. It is not our business here to account for the idea of gods and spirits: it suffices if we know that it exists. When therefore an ultimate cause is to be assigned for the ultimate of sensible causes, it will be a God. But just as when he looked for the ultimate Cause among sensible objects, that passed for ultimate which was unique, supreme, and above all things else in power and dominion: so too must this God be unique, supreme, exclusive. Here then is the point where, by the crossing of the two series of conceptions (referred to already at p. 26)—viz.: on the one hand sensible objects, and on the other spirits or gods, both in their highest state of development (Sun and Sky-worship, and Polytheism)—Monotheism is evolved. The proofs of this proposition are not in place in an essay on fetichism: it will be sufficient if we show from history that the *question* we have spoken of does actually arise where man has reached the highest stage of fetichism, and that it is answered precisely as we have said.

Of the famous Inca, Tupac Jupanqui,* Garcilasso states that "he was wont to say: Many hold that the sun is endowed with life, and that he is the creator of all things. But whoever creates a thing must be present when he creates it: but now sundry things are produced in the absence of the Sun: therefore the Sun is not the creator of all things. Furthermore, his never tiring is proof that he is not a living thing. If he had life, he would weary even as we: and were he free, he would visit other regions of heaven besides those in which his daily course now lies. He is, as it were, an object that is restricted in its movements, and which ever describes the self-same course; or like the arrow which flies in the direction in which it is shot, and which cannot choose its own course." Another Inca was once, upon the feast of Raymi, attentively contemplating the Sun. A priest having twice reminded him that the reverence due to that luminary forbade such conduct, the monarch replied: "I will put you two questions. I am your king and lord. Would any of you venture to order me to rise from my throne and set out on a long journey? And would any of my vassals be so bold as to refuse obedience, were I to command him forthwith to hasten off to Chile?" The priest having answered both questions in the negative, the monarch thus continued: "My word for it, there must be over the Sun, our Father, a master greater and mightier still, who requires him to perform his daily course: for were the Sun himself the Supreme Lord, he would not pursue forever the same daily path: he would rest when it pleased him, even though he had no need of rest."*

One of the most eminent of the Mexican kings, "an intellectual hero of the New World," was Nezahualcoyotl. "His enlightened mind, and the love he had for his subjects, largely contributed to make his court famous, and it was ever after regarded as the home of the arts and the center of refined culture. At Tezcuco, his capital, the Mexican language was spoken with the greatest purity and correctness; and there were always to be found the best artists, and a vast assemblage of poets, orators and historians. Not alone the Mexicans themselves, but many other nations received laws from Tezcuco, and hence we might say that Nezahualcoyotl was the Solon, and his capital the Athens of Anahuac."† Well-versed in the poetry of his native land, the king was himself a poet of some distinction, and as late as the 16th century sixty hymns composed by him in honor of the Creator of the heavens were held in high esteem even by the Spaniards. "But nothing possessed so deep an interest for Nezahualcoyotl as the study of Nature. He acquired a considerable

* Garcilasso, VIII. 8.

* Acosta, Balboa, 59; *apud* Waitz, IV. 449.

† Clavigero, I. p. 175 seq.

amount of astronomical knowledge from the numerous observations which he directed to be made of the courses of the stars. He also devoted much time to the study of botany and zoology, and those specimens which, as requiring a different climate, could not live at the capital, he had painted in the natural size on the walls of his palace. *He studied attentively the causes of the phenomena of Nature, and this study led him to recognize the worthlessness of idolatry.* He told his sons, in confidence, that whilst they paid exterior reverence to the idols, in deference to public sentiment, they should in their hearts abhor this contemptible worship of inanimate things. As for himself, he acknowledged no god save the Creator of the Heavens, but he did not forbid idolatry, much as he wished to do so, lest any man should charge him with setting himself in opposition to the teachings of his forefathers. He prohibited human sacrifices, but succeeded only so far as to limit them to the offering of prisoners of war."* To his "Unseen God," "the Unknown God, the Cause of Causes,"† he dedicated a tower of nine stories, with roof painted blue, and studded with golden stars.*

At stated hours certain officials appointed for the purpose struck a sonorous metallic plate in the tower, at which signal the king knelt and recited a prayer. From the ornamentation of this tower, as well as from his poems,† it is plain that, as Prescott says, "he combined star-worship with worship of the Almighty;" or rather, by combining star-worship with Polytheism, he reached Monotheism. This is clear from what Ijtliljochitl says of him, viz., that although he "invoked the Almighty, by whose grace we live, and who hath in himself all things," still he also "acknowledged the sun to be his father and the earth his mother."‡

* Clavigero, I. p. 175 seq.

† "Al Dios no conocido, Causa de las Causas." M. S. de Ijtliljochitl apud Prescott, I. 155.

* "Su boveda estaba pintada de azul." Clavigero, I. 176.

† "Let us strive heavenward, for there all is everlasting and incorruptible." Aspiremos ál cielo, que allí todo es eterno y nada se corrompe. "The horrors of the grave are but the Sun's cradle; and the sombre shadows only brilliant lights for the stars." El horror del sepulcro es lisongera cuña para el, y las funestas sombras brillantes luces para los astros.

‡ *Apud* Prescott, I.

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THE DISEASES OF PERSONALITY.

By TH. RIBOT.

Translated from the French by J. FITZGERALD, M.A.

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CHAPTER I.

INTRODUCTION.—PERSONALITY.—INDIVIDUALITY.—CONSCIOUSNESS.

In the language of psychology the general meaning of the term "person" is, an individual being that has a clear consciousness of itself and that acts consequently: it is the highest form of individuality. Metaphysical psychology, to explain this character (which it reserves for man exclusively) merely assumes a Me [*ego*], absolutely one, simple, and identical. Unfortunately, the explanation is illusive, the solution only apparent. Unless we assign a supernatural origin to this Me, we must needs explain how it comes to be, and from what lower form it springs. Experimental psychology can neither state the problem in the same way nor treat it by the same method. It learns from natural history how difficult it is in many cases to determine the characters of individuality, far less complex though they be than those of personality; simple, easy solutions it mistrusts, and far from supposing the problem to be resolvable at the first attack, it finds the solution at the final term of its researches, as the result of laborious investigations. It is therefore quite natural that the representatives of the old school, being a little off their bearings, should accuse those of the new school of "stealing their Me," though nobody has attempted anything of the kind. But the language of either side is so different from that of the other, and their methods are so opposite that they no longer understand one another.

At the risk of increasing the confusion, I would try to find out what is to be learned from teratological, or morbid, or merely rare cases, touching the formation and disorganization of personality, but without pretending to treat the subject in its entirety: that undertaking were, it seems to me, premature.

Personality being the highest form of psychic individuality, a preliminary question arises: What is an individual? Few problems have in our days been more discussed by naturalists than this, and few remain more obscure as regards the lower grades of animal life. It is not yet time to treat it in detail: in the conclusion of this work, after we shall have studied the constituent elements of personality, we will consider personality itself as a whole. Then we shall take occasion to compare personality with the lower forms through which nature has essayed to produce it, and to show that the psychic individual is only the expression of the organism: like it of low grade, undifferentiated, incoherent, or complex and integrated. For the present it suffices to remind the reader who has already some acquaintance with these studies, that as we descend in the animal series, we see the psychic individual formed by more or less perfect fusion of less complex individuals—a colony-consciousness being produced by the co-operation of local consciousness. These discoveries in natural history are of the utmost importance for psychology. Owing to them the problem of personality takes a new form: it must be approached from below; and one is led to ask whether the human personality itself is not a "coalition whole" whose extreme complexity makes its origin difficult to discover, or even inscrutable, did not the existence of elemental forms throw some light upon the process of this fusion.

Human personality—and of this alone can we treat to any purpose, especially in a pathological essay—is a concrete whole, a complex. To know what it is, we must

analyze it, and here analysis is of necessity artificial, for it separates groups of phenomena that are not merely juxtaposed but co-ordinated, and standing toward one another not in the relation of mere simultaneity but of mutual dependence. Still analysis is indispensable. Adopting therefore a division of the subject which I hope will be its own justification, I will consider successively the *Organic*, the *Affective*, and the *Intellective* conditions of personality, laying stress upon anomalies and irregularities. Upon a final survey of the subject we shall group together again these dissevered elements.

But before we begin the exposition and interpretation of the facts, it will be well to have an understanding as to the nature of consciousness. I do not propose to write a monograph on consciousness, for that would cover pretty nearly the whole field of psychology; it will be enough to state the problem with precision.

Details apart, we find only two hypotheses: one very ancient, according to which consciousness is the fundamental property of the "soul," or the "mind," constituting its essence; the other very recent, which regards consciousness as a simple phenomenon superadded to the cerebral activity, as an occurrence having its own conditions of existence, and which comes or goes as circumstances decide.

The former hypothesis has been in vogue so long that it is easy to judge of its merits and its defects. I am not called upon to pass sentence upon it; I will simply show its utter powerlessness to explain the mind's unconscious life. In the first place, for a long time it took no cognizance of this unconscious life. Leibnitz's clear and profound observations on that point lie forgotten or at least in abeyance; and till well on in the present century the most distinguished psychologists (with a few exceptions) restricted themselves to consciousness. At last, when the question must be heard, and when it was clear to every one that to regard psychic life as embracing simply the data of consciousness is a conception so poor and jejune as to be of no use in practice, then the metaphysical psychologists were in a quandary. They adopted the hypothesis of "unconscious states," an ambiguous and semi-contradictory term soon widely accepted. the term itself betrays the confusion of ideas amid which it arose. What is meant by "unconscious states?" The wise note their existence, without trying to account for them; the less wise talk of latent thought, of unconscious consciousness—expressions so vague, so illogical, that many authors have admitted as much. In truth, if the soul be defined to be thinking substance, whereof states of consciousness are modifications, it is plainly a contradiction in terms to ascribe to it unconscious states. No fetch of language, no trick of dialectic can help the matter: and forasmuch as the high importance of these unconscious states as factors of psychic life is undeniable, there is no escape from the situation.

The second hypothesis clears the ground of all this logomachy. It does away with the factitious problems that swarm in the first (*e.g.* whether consciousness be a general or a particular faculty, etc.), and we may fearlessly claim for it the benefit of the *lex parcimoniæ*. It is the simpler, the clearer, the more consistent of the two. Compared with the other, it may be characterized as expressing the unconscious in physiological terms (states of the nervous system) and not in psychological terms (latent thought, sensations not sensed, etc.). But this is only a particular case of the hypothesis: we have now to consider it as a whole.

I would remark first that consciousness, like all general terms, must be resolved into concrete data. Just as there is not a will in general, but only volitions, so there is not a consciousness in general, but only states of consciousness: and these alone are real. As for defining the state of consciousness, the fact of being conscious, that were a vain and idle attempt: it is a datum of observation, an ultimate fact. Physiology shows that its production is always associated with the activity of the nervous system and in particular of the brain. But the converse proposition is not true: though psychic activity always implies nerve activity, nerve activity does not always imply psychic activity. Nerve activity has far greater extension than psychic activity: hence consciousness is something superadded. In other words, we must regard a state of consciousness as a complex fact (*événement*, event, occurrence) which presupposes a particular state of the nervous system; nor is this nervous process an accessory but on the contrary an integral part of the fact—nay, its groundwork, its fundamental condition; once produced, the fact exists *in* itself; when

consciousness is added, the fact exists *for* itself; consciousness completes it, gives it the finishing touch, but does not constitute it.

Upon this hypothesis we readily understand how every manifestation of psychic life—sensations, desires, feelings, volitions, recollections, reasonings, inventions, etc., may be alternately conscious and unconscious. There is nothing mysterious in this alternation, because in every case the essential conditions, *i.e.*, the physiological conditions, remain the same, and consciousness is only complementary—the finish.

The question would remain, why this finish sometimes is added, sometimes is lacking; for were there not in the physiological phenomenon itself something more in the former case than in the latter, the adverse hypothesis would be indirectly strengthened. If it could be shown that whenever certain physiological conditions are present there is consciousness, that when they disappear, consciousness too disappears, and that when they vary, consciousness varies: then we should have no longer an hypothesis but a scientific truth. That is a distant prospect indeed. Still we may confidently predict that consciousness at least will never give us these revelations touching itself. As Maudsley justly says, consciousness cannot be at once effect and cause—cannot be at once itself and its molecular antecedents: it lives for an instant only and cannot by a direct intuition turn back to its immediate physiological antecedents; and besides, to descend again to these material antecedents were to lay hold not of itself but of its cause.

It would be for the present chimerical to undertake to define even roughly the necessary and sufficient conditions of the apparition of consciousness. We know that the cerebral circulation, as regards the quantity and the quality of the blood, has a good deal to do with the case. Of this we have striking proof in experiments made on the heads of animals immediately after decapitation. So too we know that the duration of the nervous processes in the centers is an important point. Psychometric research daily shows that a state of consciousness takes longer time in proportion to its greater complexity, and that on the other hand automatic acts, whether primordial or acquired, the rapidity of which is extreme, do not enter the consciousness. It may also be affirmed that the apparition of consciousness is connected with the period of the disassimilation of nerve tissue, as Herzen has shown in detail.* But all these results are but partial gains, while a scientific account of the genesis of a phenomenon requires a determination of *all* its essential conditions.

This the future will yield perhaps. In the mean time we shall best strengthen our hypothesis by showing that it alone explains one highly important character—and not merely a condition—of consciousness, namely its *intermittence*. To avoid all misunderstanding at the outset, be it noted that the question is not as to the discontinuity of states of consciousness with one another. Each has its limits which, while they allow it to be associated with others, preserve its own individuality. Not of this do we speak, but of the well known fact that consciousness has interruptions: in ordinary language, a man is not always thinking.

True it is, that this assertion has been contradicted by the majority of metaphysicians. But they have never furnished proof in support of their thesis; and, as all the facts apparently are against it, the burden of proof seems to lie upon its advocates. Their whole argument is in effect that since the soul is essentially a thing that thinks, consciousness must needs always exist in some degree, even though no trace of it subsists in the memory. But this is simply begging the question, for the hypothesis we maintain challenges their major premise. Their alleged proof is, after all, only an inference drawn from a contested hypothesis.

Let us put aside all *a priori* solutions and look at the question as it is in itself. Let us consider, not cases of syncope, artificial anæsthesia, epileptic vertigo, coma, etc., but the familiar and frequently occurring psychic state of sleep. It has been asserted that sleep is never dreamless; but that is a purely theoretic assertion, based on the thesis that the soul is ever thinking. The only fact that can be cited in support of this proposition is that sometimes a sleeper, when called or questioned, responds in suitable fashion, but on waking has no recollection of the occurrence. But this fact does not justify a general conclusion, and the theory of the metaphysicians is met by the physiologists with another. Physiology teaches us that the life of every organ comprises two periods, one of compara-

**La Condizione fisica della Conscienza. Roma*, 1879.

tive repose, or of assimilation, the other of activity, or of disassimilation ; that the brain presents no exception to this law, and that experience shows the duration of sleep, in the several epochs and circumstances of life, to be in direct ratio to the need of assimilation. The cause of sleep is the necessity of repairing losses, of making the nutritive circulation succeed to the functional circulation. In wakefulness, the brain burns up more material than is given to it by the blood, so that oxidation soon grows less, and with it the excitability of the nerve tissue. Preyer's experiments show that sleep comes when, in consequence of prolonged activity, the substance of the brain, like that of a fatigued muscle, finds itself overloaded with a certain quantity of acid *detritus*. The very presence of these products arrests, at a given moment, the cerebral activity, which does not reappear till repose has allowed complete elimination of these waste matters. * It must be admitted that complete, absolute sleep, without any dream, is the exception ; but that such sleep occurs, and that not rarely, is sufficient to establish the intermittent character of consciousness.

The physiological thesis possesses a probative value very different from, and much stronger than, that of the metaphysical thesis. And it must be remembered—an important point—that all those who have investigated the question whether there exists perfect cerebral sleep, are men of cultivated and active minds—psychologists, physicians, literary men—in whom the brain is ever wakeful, vibrating like a sensitive musical instrument in response to the slightest excitation : in them consciousness is a habit, so to speak. Those who put to themselves the question whether sleep is always accompanied by dreams, are, in fact, the ones least fitted to give a reply in the negative. Among hand workers, this is not the case. A farm-laborer living remote from all intellectual agitation, ever restricted to the same occupations, to the same routine, usually does not dream. I know several peasants who look on a dream as a rare occurrence in their hours of sleep.

"The most convincing proof that the mind can be completely inactive during sleep—that it can have its existence momentarily interrupted or suspended—would indisputably be afforded if the instant of falling asleep should connect immediately with the instant of awaking, and if the intervening time should be as though it had not been. The philosophers who do not believe in perfect sleep have themselves pointed out this test, at the same time declaring that it has never been verified. But I have been witness of the fact under the following circumstances : One morning, at 2 o'clock, I was called to attend a person in the neigborhood attacked by cholera. As I was about to go out, my wife gave me some direction about the candle I held in my hand, and then fell asleep. I came back after about half an hour. The noise of the key turning in the lock as I opened the door, awakened my wife suddenly. So deep had been her sleep, so close was the conjunction of the moment when she fell asleep, with the moment when she was awakened, that she supposed she had not slept at all, and that she took the sound of the key upon my return, for the same sound at my going. Seeing me re-enter, she believed I was simply turning back on my steps, and asked me the reason ; great was her astonishment on learning that I had been absent half an hour." †

I know not how facts of this kind can be met, except by falling back upon the inevitable hypothesis of states of consciousness that have left no trace in the memory : but that hypothesis, I repeat, is gratuitous and improbable. Those who are subject to fits of swooning with loss of consciousness, know by experience that, while the fit is on, they may suffer a fall or contusion of a member, or overturn a chair, and, yet, on coming to themselves, have no idea of what has happened. Is it likely that these rather serious accidents, had they been accompanied by consciousness, would have left no memory lasting at least a few seconds. I do not in any wise deny that in certain circumstances, whether normal or morbid, —for instance, in hypnotism—states of consciousness that leave no trace apparent at the awakening, may later be recalled ; I will restrict as much as any one may wish, the cases of complete interruption of consciousness ; but one single case suffices to raise up insuperable difficulties against the hypothesis of the soul being substance which thinks. On the opposite hypothesis, all is easily explained. If consciousness is an occurrence depend-

* By absorbing a certain quantity of lactate of soda, taken as a type of disassimilation products in the brain, Preyer produced yawning, somnolence, and even sleep.

† Despine, *Psychologie Naturelle*. I., p. 522. Writers on insanity mention cases where, a pathological state suppressing consciousness abruptly, the patient, after a longer or shorter interval, resumes his conversation at the word where he had been stricken. See other facts of like nature in Winslow, *On Obscure Diseases*, etc., p. 322 *et seq.*

ent on determinate conditions, it need not surprise us if sometimes it is wanting.

Were this the place to discuss the question of consciousness thoroughly, we might show that on our hypothesis the relation of the conscious to the unconscious is no longer unsettled or contradictory. The term *unconscious* may always be expressed by this periphrasis: A physiological state which, though sometimes, and even most frequently it is accompanied by consciousness, or may have been so accompanied originally, is at present not accompanied by consciousness. This characterization, though negative as regards psychology, is positive as regards physiology. It declares that in every psychic happening the fundamental, active element, is the nervous process, and that the other is but concomitant. Consequently it is easy to see that all of the manifestations of psychic life may be unconscious and conscious by turns: for the former case there is required (and this suffices) a determinate nervous process, that is to say, the calling into action of a determinate number of nerve elements forming a determinate association, to the exclusion of all other nerve elements and of all other possible associations. For the second case it is required (and this suffices) that supplementary conditions of whatever kind be added, without changing aught in the nature of the phenomenon, save to render it conscious. And here we see how unconscious cerebration does so much work quietly, and how, oftentimes after protracted incubation, it manifests itself by unexpected results. Each state of consciousness represents only a very small part of our psychic life, for unconscious states ever underlie it and as it were thrust it forward. Every volition, for instance, has roots deep down in our being; the motives that accompany and apparently explain it are never more than a part of the true cause. So it is with many of our sympathies; and so evident is this fact, that minds most deficient in observation often wonder that they cannot account for their likes and dislikes.

It were tedious as well as needless to pursue this demonstration farther. Should the reader wish to do so he may consult, in Hartmann's *Philosophy of the Unconscious*, the section entitled "Phenomenology." There he will find classified all the manifestations of the mind's unconscious life, and he will see that there is not one fact that is not explained by the hypothesis here maintained. Let him then apply to the same facts the other hypothesis.

One point more remains to be considered. The theory which regards consciousness as a phenomenon, and which springs (as could be shown were the digression allowable here) from that fundamental principle in physiology that "reflex action is the type of nerve action and the basis of all psychic activity," to many sound intellects appears paradoxical and irreverent. They think it robs psychology of all stability and dignity. They are loath to admit that all the highest manifestations of nature are instable, fleeting, superadded, and, as regards their conditions of existence, subordinate. But that is only a prejudice. Consciousness, whatever be its origin, and its nature, loses naught of its value; it is to be esteemed for what it is in itself; and for the one who takes the evolution point of view, it is not the origin that is of importance but the height attained. Experience too teaches us that as we ascend in the series, natural compounds are more and more complex and instable. Were stability to measure dignity the highest place would belong to minerals. This objection then, a purely sentimental one, is inadmissible. As for the difficulty of explaining on this hypothesis the unity and continuity of the conscious subject, it is not yet time to speak of it. It will be considered in due course.

But the hypothesis of consciousness as phenomenon has a weak side: its sincerest partisans have maintained it under a form that has won for them the title of advocates of absolute automatism. They are wont to compare consciousness to a ray of light from the furnace of a steam-engine that lights up the machine but has no effect whatever on its work; according to them consciousness has no more action than the shadow that accompanies the wayfarer's steps. If these similes have no purpose save to express the doctrine in a telling way, there is nothing to say; but taken in their strict sense they are exaggerated and inexact. Consciousness in itself and by itself is a new factor; and in this there is nothing mystical nor supernatural, as we shall see.

In the first place, from the hypothesis itself, a state of consciousness supposing a greater number of physiological conditions (or at least different ones) than

does the same state when it remains unconscious, it follows that two individuals, one of them in the former state, the other in the latter, are not, other things being equal, strictly comparable.

Stronger proofs still remain—not logical deductions but facts. When a physiological state is become a state of consciousness, it thereby acquires a special character. Before, it had relation to space, and could be conceived of as the calling into action of a certain number of nerve elements occupying a determinate superficies: but now it takes a position in *time*—comes after this, follows that, whereas for unconscious states there is neither before nor after. It now is capable of being recalled, *i. e.*, recognized as having occupied a definite position among other states of consciousness. Hence it is become a new factor in the individual's psychic life, a result that may serve as a starting point for some new work whether conscious or unconscious; and so far is it from being the product of a supernatural operation that at bottom it is simply a case of that organic registration which underlies all memory.

To reach greater clearness let us take a few examples. Volition is always a state of consciousness: it says that a thing should be done or prevented. It is the final and definite result of a multitude of states, conscious, semi-conscious, and unconscious; but once affirmed, the volition becomes in the individual's life a new factor. The resolution taken marks a sequence, and it is capable of being recommenced, or modified, or inhibited. Automatic acts unaccompanied by consciousness do not admit of anything like this. Novelists and poets, accurate observers of human nature, have often noted the situation where a passion—love or hate—after lying for a long time latent and unconscious, at last comes to the light, assumes definite form, becomes conscious. Its character is then changed; it acquires increased intensity, or it is overpowered by other antagonistic passions. Here again consciousness is a new factor that has modified the psychological situation. Take another example. One may by instinct, that is by unconscious cerebration, solve a problem, yet quite possibly at another time he may be stalled by a similar problem. If on the other hand the solution is reached through conscious reasoning, difficulty with the second problem is far less probable, for each step forward is a new position won, and thereafter we no longer walk as blind. But this in no wise belittles the part played in invention and discovery by the unconscious work of the brain.

These examples, taken at random, suffice to show that the similes mentioned above are true with respect to every state of consciousness *in itself*. It is indeed in itself only a light that makes visible unconscious work: but viewed in its relation to the future development of the individual it is a factor of the highest importance.

And what is true of the individual is true also of the species and of the succession of species. Considered merely with reference to the survival of the fittest, and quite apart from all psychological considerations, the apparition of consciousness upon the earth was an event of prime consequence. Thereby was made possible for the animal world experience, *i.e.*, a higher order of adaptation. Wherein consciousness had its origin we need not inquire. Some highly ingenious hypotheses have been put forward upon the subject—hypotheses that enter the domain of metaphysic—but these experimental psychology need not discuss, for it assumes consciousness as a datum. It is probable that consciousness, like every other manifestation of life, first made its appearance in a rudimentary form, and seemingly with poor endowment. But when it had become capable of establishing in the animal a memory in the psychic sense, so enabling it to bank upon its past for the benefit of the future, there was a new chance of survival. To unconscious, blind, accidental adaptation, dependent on the environment, there was added a conscious, coherent adaptation dependent on the animal itself, and more steady and more rapid than the other: it curtailed the labor of selection.

The part of consciousness, then, in the development of psychic life is plain. I have dwelt upon this point because the supporters of the hypothesis here maintained have usually studied consciousness only as it actually exists, not noting sufficiently the result of its apparition. They rightly say that it illumines, but they have not shown that it brings something additional. Consciousness, I repeat, is in itself only phenomenon, an accompaniment. If there exist animals in which consciousness appears and disappears every moment, leaving no trace, these are mental automata in the strictest sense: but if the state of consciousness leaves a residuum, an enregistration in the organism, then it acts not only as an indicator but as a con-

densator; and the metaphor of the automaton is no longer valid. This admitted, many of the objections to the theory of consciousness as a phenomenon fall to the ground.

CHAPTER II.

ORGANIC DISTURBANCE.

I SHALL treat at length of the organic conditions of personality, for on these all depends and these explain all the rest. Metaphysical psychology has hardly taken any notice of them, therein showing logical consistency, for in its view the Me comes from above not from beneath. We on the other hand must seek the elements of personality in the most elemental phenomena of life: these confer upon it its distinctive character. The "organic sense," the "sense of the body"—a sense with us vague and obscure generally, though at times very well defined—is for each animal the basis of its psychical individuality.* This is that "principle of individuation" so much sought after by the scholastic philosophers, for on it directly or indirectly all depends. It may be regarded as highly probable that as we descend toward the lower animals, the organic sense becomes more and more dominant till it becomes the whole psychic individuality. But in man and in the higher animals the bustling world of desires, passions, perceptions, images, ideas, overlies this voiceless deep: save at intervals we forget it because we ignore it. It is as with facts of the social order. The millions of human beings that make up a great nation are for itself and the rest of the world reduced to a few thousand men who, so to speak, are its clear consciousness, and who represent its social activity in every phase—political, industrial, commercial, intellectual. Still it is the millions of common people, ignored, leading a narrow, local life, living and dying unnoticed, that constitute the nation's mass: without them it is nothing. They are the inexhaustible reserve out of which, by natural selection, a few emerge, rising to the surface, but these, however endowed with talent, power, or wealth, have only an ephemeral existence. The degenerescence naturally inherent in whatever rises above the general level will lower them or their descendants, while the mute toil of the millions who live ignored will continue to produce others and to imprint a character upon them.

Metaphysical psychology notes only the summits of the prospect, and inner observation has but little to tell of what takes place within the body; hence the study of the general sensibility has been from the first the special work of physiologists.

Henle (1840) thus defines general sensibility, or "cœnæsthesis": It is, he says, "the *tonus* of the nerves of sensation, or the perception of the state of activity in which these nerves constantly exist, even at moments when no impression from without is acting upon them." "It is," says he in another place, "the sum, the indiscriminated chaos of the sensations that are continually coming into the sensorium from all parts of the body." † E. H. Weber, with greater precision, defines cœnæsthesis to be an inner sensibility, an inner touch, which informs the sensorium of the mechanical and chemico-organic state of the skin, the mucous and serous membranes, the viscera, the muscles, the joints.

Louis Peisse, a physician and a philosopher, was the first man in France to combat the teaching of Jouffroy who held that we know not our own bodies save objectively, as an extended, solid mass like all other bodies; lying outside of the Me, and alien to the percipient subject as any strictly external object might be—as a table or a chair. Peisse showed, though rather timidly, that our knowledge of our own bodies is above all subjective. His description of this organic consciousness seems to me so exact that I quote it entire.

"Is it true" he says, "that we have absolutely no consciousness of the exercise of the organic functions? If you mean clear, distinct, locally determinable consciousness, like our consciousness of external impressions, plainly it is lacking: but we may have a faint, indistinct, so to speak, a latent, consciousness of it; for instance such a consciousness as we have of the sensations that call forth and accompany the respiratory movements—

* It may be remarked in passing that a great metaphysician, Spinoza, clearly maintains the same thesis, though in different terms. "The object of the idea that constitutes the human soul is the body, . . and nothing but the body."—"The idea which constitutes the formal being of the human soul is not simple but made up of many ideas." *Ethics*, Part II., Props. 13 and 15.

† *Pathologische Untersuchungen*, p. 114. *Allgemeine Anatomie*, p. 728.

sensations which though continually repeated pass unnoticed as it were. May we not indeed regard as a distant, faint, confused echo of the general vital work the peculiar feeling which continuously and unremittingly makes us aware of the presence and actual existence of our own body? This feeling has nearly always, but erroneously, been confounded with the chance local impressions which during wakefulness arouse, stimulate, and keep up the action of the sensibility. These sensations, though incessant, appear but for a moment on the stage of consciousness and pass away, whereas the feeling of which we speak endures and persists beneath this shifting scenery. Condillac properly enough called it 'the fundamental feeling of existence,' and Maine de Biran the feeling of sensitive existence. Through it the body is ever present to the Me as *its own*; through it the spiritual subject feels and knows itself to exist in some sort locally in the limited extension of the organism. It is a never-failing remembrancer, rendering the state of the body ever present to consciousness; thus does it most clearly show the indissoluble tie between psychic and physiological life. In the ordinary state of equilibrium which constitutes perfect health this feeling is continuous, uniform, and always equable; and just because it is thus continuous, uniform and equable it does not enter the Me as a distinct specific, local sensation. In order to be distinctly noted, it must gain a certain intensity; then it expresses itself by a vague impression of general well-being or general discomfort, the former state indicating a simple exaltation of physiological vital action, the latter betraying a pathological perversion of the vital economy, but in this case it soon becomes localized in the shape of particular sensations referred to one or another part of the body. Sometimes it manifests itself in a more indirect way, yet far more clearly, when it chances to fail at any given point in the organism, as for example in a member stricken by paralysis. The stricken member still belongs by nature to the living aggregate, but it is no longer within the sphere of the organic Me, if we may use that phrase. This Me no longer perceives it as its own, and the fact of this separation, though negative, is the object of a special positive sensation familiar to every one that knows what it is to suffer total numbness in any part of the body, as a result of cold or of compression of the nerves. This sensation is nothing else but the expression of a break in the general feeling of the bodily life: it shows that the vital state of the member was really, though obscurely, felt, and that it constituted one of the partial elements of the general feeling of the entire organism's life. A continuous, monotonous noise, as that made by a wagon in which one is riding, is not noticed though constantly heard; for should it cease abruptly its cessation would be noted instantly. The analogy may enable us to understand the nature and characteristics of the fundamental feeling of organic life, which on this hypothesis would be simply the resultant *in confuso* of the impressions produced at every point of the living organism by the action of the several physiological functions, these impressions being carried to the brain either directly by the cerebro-spinal nerves, or indirectly by the nerves of the ganglionic system." *

Since the publication of these views (1844) physiologists and psychologists have been studying the elements of this general sense of the body. They have determined what contribution is made to the result by each vital function; they have shown how complex this confused sense of life is which by incessant repetition is become our own selves, so that to examine into it is to examine into ourselves. But we know it only through the variations that lift it above the normal tone or lower it beneath the same. In special treatises may be found full details of these vital functions and their psychic bearings; such details are not called for here, and it suffices if I give a very general view of them.

First we have the organic sensations connected with respiration, the sense of well-being produced by a pure atmosphere, of suffocation in confined air; then the sensations that come from the alimentary canal; and others, that are still more general, connected with the state of the nutrition. Hunger and thirst, for example, appearances to the contrary notwithstanding, have no precise local seat: they result from a feeling of discomfort diffused throughout the entire organism: the impoverished blood is craving something. And as regards thirst in particular, Claude Bernard's experiments have shown that it comes of a lack of water in the organism, not from dryness of the pharynx. Of all the functions, the general and local circulation is perhaps the one whose psychological influence is greatest, and whose variations between individuals and at successive moments in the same individual are most striking. Then consider the organic sensations resulting from the state of the muscles—the sense of fatigue and exhaustion, or the reverse; finally, those muscular sensations which, being associated with the external sensations of sight and touch, play so large a part in our cognitions. In fact the muscular sensibility, in its purely subjective form,

* Note to his edition of Cabanis's *Rapports du Physique et du Moral*, pp. 108, 109.

by itself alone makes known to us the degree of contraction or relaxation of the muscles, the position of our members, etc. I purposely omit the organic sensations of the genital apparatus: to that subject we will return in treating of the affective bases of personality.

Let the reader for a moment consider the multitude and the diversity of the vital actions just now summarily classed under their most general heads, and he will form some conception of what is meant by the phrase "physical bases of personality." Being ever in action, they make up by their continuousness for their weakness as psychic elements. And then too, when the higher forms of the mental life disappear, these organic sensations come forward in the first rank. A very clear instance of this is found in dreams, whether pleasurable or otherwise, prompted by the organic sensations —erotic dreams, nightmare, etc. We are even able to assign with some degree of precision to each organ its special part in dreams: the sensation of weight seems specially attached to digestive and respiratory affections; dreams of struggling and fighting accompany affections of the heart. Sometimes pathological sensations, unnoticed in wakefulness, make their impression during sleep, and thus become premonitory symptoms. Armand de Villeneuve dreams that he is bitten on the leg by a dog: a few days after, the leg is attacked by a cancerous ulcer. Gessner imagines during sleep that he is bitten on the left side by a serpent: shortly afterward, an anthrax appeared at the same spot, from which he died. Macario dreams that he has a violent pain in the throat, but awakes entirely well; a few hours later he was suffering from a severe amygdalitis. A man sees in his dream an epileptic: a little while later he has an attack of epilepsy. A woman dreams of speaking to a man who cannot make her any reply, being dumb: on awaking she could not speak a word. In all these cases we recognize as facts the obscure beckonings from the depths of the organism to the nerve centers; but the conscious life, with its hubbub and its constant bustle, suppresses instead of developing them.

It is plain that psychology, by giving exclusive credit for so long a time to the data of consciousness, must needs have cast into the shade the organic elements of personality: physicians, on the other hand, were under a professional obligation to give weight to the latter. The doctrine of temperaments, as ancient as medicine itself, a doctrine that is ever criticised, ever worked over again,* is the vague, fluctuating expression of the principal types of the physical personality, as given by experience, with the chief psychic traits that result from it. Hence the few psychologists who have studied the several types of character have looked here for their basis. Thus did Kant more than a century ago. If the determination of the temperaments could be made on a scientific basis, the question of personality would be greatly simplified. In the mean time, the first thing to do is to rid ourselves of the preconceived opinion that personality is something mysterious, heaven-descended, without antecedents in nature. If we simply consider the animals around us, we shall have no difficulty in seeing that the difference between the horse and the mule, the goose and the duck, their "principle of individuation," can come only out of a difference of organization and of adaptation to environment, with the psychic consequences thence resulting, and that, within the same species, the differences between one individual and another must have come about originally in the same way. There is no reason in the nature of things for classing man separately: the simple fact is that in man the very great development of the intellectual and affective faculties produces an illusion and conceals the fact of origination.

Taking physical personality to mean simply a sense of the state of the organism—a mode of existence in which, on the hypothesis, all consciousness, clear or obscure, original or recalled, of any outer fact is absent, we ask, Does such a thing exist in nature? Clearly not in the higher animals; and it can be posited only as a highly artificial abstraction. But it is probable that this form of psychic individuality, which is simply the consciousness the animal has of its own body, exists in the lower species, though not in the lowest.

In the lowest species—instance any

* Quite recently Henle (*Anthropologische Vorträge* [1887], pp. 103, 130) has endeavored to refer the temperaments to the different degrees of activity, or *tonus*, of the sensorial and motor nerves. When this degree is a low one, we have the phlegmatic temperament. In a higher degree, with rapid exhaustion of the nerves, we have the sanguineous temperament. The choleric temperament also presupposes a high *tonus*, but with persistence of nervous action. The melancholic temperament can only be defined by the quantity of the nervous action: it presupposes a high *tonus* with a tendency to emotions rather than to will activity.

multicellular organism composed of cells that are all alike—the constitution of the organism is so homogeneous that each several element lives for itself, and each has its own action and reaction. But their sum no more represents an individual than six horses drawing a wagon constitute one horse. There is neither coördination nor *consensus*, but only juxtaposition in space. If, as many authors do, we were to give to each cell the analogon of a consciousness (which would be only the psychic expression of its irritability) we should then have consciousness in the state of complete diffusion. Between the elements there would be an incompenetrability which would leave the whole mass in the state of living matter without even external unity.

But higher in the animal scale, for instance in the Hydra, observation finds a certain *consensus* among the actions and reactions and a certain division of labor. Still the individuality is highly precarious: Trembley cut one hydra into fifty individuals. But inversely two hydras may be made into one: it is only necessary to turn the smaller one inside out and then thrust it into the larger, so that the two endoderms may come into contact and grow together. As far as one may venture an opinion on so obscure a subject, the adaptation of movements denotes a certain unity, temporary, instable, at the mercy of circumstances, it may be, but probably not without some faint consciousness of the organism. If still we are observing too low a stage of animal life, we may at pleasure go higher to find the point where the creature has simply a consciousness of its organism—organic consciousness. Even this form of consciousness probably does not exist in its purity, for as soon as the rudiments of special senses appear, the animal rises above the level of general sensibility; and besides, is general sensibility of itself enough to constitute a consciousness? We know that the human fœtus makes efforts to free itself from an inconvenient position, from the impression of cold, from painful irritation; but are these movements unconscious reflex actions?

But I haste to quit these conjectures. The undisputed fact is that organic consciousness (*i.e.* the animal's consciousness of its body and of nought but its body) is vastly preponderant in the greater part of the animal world; that it is in the inverse ratio to the higher psychic development; and that everywhere and always this consciousness of the organism is the basis on which individuality rests. In virtue of it the whole structure stands: without it the structure is nought. The contrary thesis is unintelligible, for is it not through the organism that we receive external impressions, the *materia prima* of all mental life? And what is more, is it not upon it that we find inscribed and fixed by heredity, how we know not, yet, as facts prove, in characters indelible, the instincts, feelings, aptitudes peculiar to each species, to each individual?

If then it be confessed that the organic sensations coming from the tissues, from all the organs, from all the organic movements, in short from all the bodily states, are, in whatever form, in whatever fashion represented in the sensorium, and if the psychic personality is simply their sum, it follows that, like them and with them, the personality must vary, and that these variations range through all possible degrees, from simple indisposition [*malaise*] to total metamorphosis of the individual. The phenomenon of "double personality" which has made such a noise—and I shall treat of it later—is only an extreme instance. Granted sufficient patience and sufficient research, and we should find in mental pathology plenty of observations to prove a progression, or rather a continuous regression from the merest passing change to the most complete transformation of the Me. The Me exists only on the condition that it vary continually: that point is not disputed. As for its identity, that is only a question of number: it persists so long as the sum of the states that remain relatively fixed is greater than the sum of the states added to or taken from this stable group.

At present we have to study only disorders of personality directly connected with the organic sensations, and since in itself general sensibility possesses but an inconsiderable psychic value, it produces only partial disorders, except when the transformation is total or sudden.

We begin with the consideration of a state hardly to be called morbid, a state probably familiar to every one: the feeling of exaltation or of depression which comes upon a person without known cause. The habitual tone of the individual changes: it rises or falls. In the normal state there is a positive "euphoria": there is neither bodily satisfaction nor bodily indisposition. At times, on the other hand, the vital functions are in a higher tone: there is unwonted or-

ganic activity which seeks to expend itself; every enterprise seems easy, every scheme promising. This state of satisfaction, at first purely physical, becomes diffused over the whole nervous organization, summoning up a host of pleasurable feelings to the exclusion of whatever displeases. The subject sees everything in a rosy light. Again the reverse condition obtains: a state of indisposition, depression, inertia and helplessness, and consequent upon this a feeling of gloom, apprehension, downheartedness. The man sees nothing to cheer him. But in neither case has anything occurred, any influence come from without that might account either for the gladness or for the gloom.

Assuredly we may not affirm that the personality has been transformed in the strict sense of the term. It has been transformed relatively. For himself and still more for those who know him, the individual is changed, is no longer the same. Translated into the language of analytical psychology, this means that his personality is made up of elements, some of them relatively stable, the others variable; and that the variable elements having overpassed considerably their habitual limit, the stable elements assume a lower ratio to the whole, without disappearing.

Now suppose—and the supposition is realized every day—that this change, instead of passing away after a little while, and giving place to the normal state, itself persists: in other words, suppose the physical causes that produce it to be permanent instead of being transitory; then there results a new physical and mental habitude, and the individual's center of gravity tends to displacement.

This first change may lead to other changes so that the transformation shall go on increasing. At present I will not dwell upon this: my wish was simply to show how from a very common physical and psychic state it is possible to descend little by little to complete transformation. It is only a question of degrees.

In studying the disorders of personality it is impossible rigorously to determine those which have their *direct* cause in perturbations of the general sensibility, for the latter often, by their secondary action, summon up psychic states of a higher order—hallucinations, and morbid feelings and thoughts. I shall limit myself to cases in which disorders of the general sensibility seem to be predominant.

In the *Annales Médico-psychologiques* (Sept. 1878) we find recorded five observations grouped under one heading: "An aberration of physical personality." Without caviling at the title, which perhaps says more than it ought to say, we see here an unknown organic state, a change of the cœnæsthesis producing, in the absence of all external causes, a feeling of bodily annihilation. "While in the enjoyment of perfect health, with exuberant strength and vitality, a person experiences a sensation of ever increasing weakness, so that he apprehends every moment that he is about to fall into syncope, and to be extinguished." Meanwhile the sensibility is intact; the patient eats with a good appetite; and if any one attempts to act contrary to his will, he reacts with the utmost energy. He keeps repeating that he feels himself dying, his light going out little by little; that he has not more than a few hours of life left. Naturally upon this purely physical stock delirious conceptions become engrafted: one patient declares that he is poisoned, another that a demon has entered his body and "is sucking the life out of him."

Let us fix our attention upon the immediate consequences of the physical state. We find here that state of depression already described and familiar to every one, but in a far more serious and more stable form. The mental disorder increases equally and becomes systematized. The individual becomes more and more unlike his former self. Another stage is reached on the road to the break-up of the Me, but dissolution is still a long way off.

This beginning of transformation, resulting from natural causes, is seen also in patients who say that they are enveloped with a veil or with a cloud; that they are cut off from the outer world, and insensible to everything. Others—and in their case the phenomena may be referred to disordered muscular sensibility—enjoy with rapture the lightness of their bodies, feel themselves suspended in air, fancy that they can fly; or they have a sense of weight throughout the whole body or in some of their members, or in one, and that one they imagine to be of enormous size and weight. "A certain young epileptic at times felt his body so uncommonly heavy that he could hardly support its weight: again it was so light that he fancied he did not touch the ground. Sometimes his body seemed to him to have assumed such proportions

that no doorway was wide enough to afford him passage." *

Patients subject to illusions regarding the size of their bodies may fancy them to be either very much larger, or very much smaller than they are.

The *local* perversions of the general sensibility, though by nature restricted, are nevertheless of great importance psychologically. A patient will assert that he no longer has any teeth, or that he has no mouth, stomach, intestines, brain, etc. This state can be explained only by a suppression or an alteration of the inward sensations that exist in the normal state, and which go to make up the conception of the physical Me. To the same cause, sometimes conjoined with cutaneous anæsthesis, are to be referred cases where the patient believes that some one of his members or even that his whole body is wood, or glass, or stone, or butter, etc.

A little later he will be saying that he now has no body, that he is dead. Esquirol tells of a woman who believed that the Devil had carried her body away: in her the cutaneous surface was totally insensible. The physician Baudelocque, toward the end of his life, was unconscious of the existence of his body. He used to say that he had no head, no arms, etc. Finally, every one is familiar with the fact recorded by Foville: A certain soldier who had been severely wounded in the battle of Austerlitz ever afterward believed himself dead. On being asked what was the news he would answer, "You wish to know how is old Lambert? He is no more, a cannon ball put an end to him. What you see is not Lambert, but a clumsy machine made to resemble him. You must ask them to make another." In speaking of himself he never said "*moi*" (I, me) but "*cela*" (this thing). The skin was insensible, and he oftentimes would fall into a state of utter insensibility and immobility lasting for several days.

Here we come to grave disorders, meeting for the first time a double personality, or more strictly a discontinuity between two periods of psychic life, a failure of them to connect. The case just mentioned may be explained thus: Before his injury, this soldier, like every one, had his organic consciousness, the sense of his own body, of his physical personality. After it, an essential change took place in his nervous organization. As regards the nature of this change unfortunately we can only offer hypotheses; the effects alone are known to us. Whatever the change may have been its result was to produce another organic consciousness, the consciousness of a "clumsy machine." Between this and the former consciousness, memory of which persisted tenaciously, no connection had been established. The feeling of identity was wanting because, as regards organic as well as other states, it can result only from a slow, progressive and continuous assimilation of the new states. In this case the new states did not enter the former Me as an integral part. Hence the odd situation, in which the former personality appears to itself as having been but now no longer existent; and in which the present state appears as something external and foreign. Finally I would remark that in states where the surface of the body is no longer sensitive; where sensations coming from the several organs are nearly null, and the superficial and the deeper sensibility is extinct, the organism no longer calls up those feelings, images and ideas which are its bond of union with the higher psychic life: it is restricted to the automatic actions that constitute the habitude and routine of life. It is properly speaking "a machine."

Should any one maintain that in this instance the only personality is that which remembers, he may do so absolutely, but it must be admitted that this personality is of a very peculiar kind, existing only in the past: hence it might be called more properly a memory than a personality.

What distinguishes this case from those we shall consider later is that here the aberration is entirely physical: it has its rise in the body, and it refers only to the body. This old soldier does not believe himself to be some one else (Napoleon, for instance, though he was at Austerlitz): the case is as free as possible from mental elements.

To perturbations of sensibility is also to be referred the illusion of some patients or convalescents who fancy themselves to be double. Sometimes there is illusion pure and simple without duplication. In that case the morbid state is projected outside of the patient—he alienates a part of his physical personality. Instances of this illusion are seen in cases like that recorded by Bouillaud

* Griesinger, *Traité des Maladies Mentales*, p. 92. Doumic's translation.

where the patient having lost sensibility on one side of the body, imagines that he has lying beside him on the bed another person, or even a dead body. But when the group of morbid organic sensations, instead of being thus alienated, cling to the normal organic personality, but without fusion, then and so long as that state lasts, the patient believes that he has two bodies. "A man convalescing after a fever believed himself to be made up of two individuals, one abed, the other walking about. Though he had no appetite, he ate a good deal, having, as he said, two bodies to feed." *

"Pariset having in his early years been prostrated by epidemic typhus, remained several days in a state of collapse nigh to death. One morning a more distinct sense of himself awoke within him; he fell a thinking, and it was like a resurrection from the dead. But, strange to tell, he had at that moment, or believed that he had, two bodies, which appeared to him to be lying in two separate beds. While his soul was present in one of these bodies, he felt well and enjoyed a delightful repose. In the other body the soul endured the suffering incident to the disease, and the patient would say, How is it that I am so easy in this bed and so ill, so wretched in the other? These thoughts engaged his mind for a long time, and with his extraordinary power of psychological analysis he oftentimes entertained me with the details of the impressions he then received." †

Here we have two instances of double *physical* personality. Though we are still but a little way on in our study, the reader may already see how these cases differ from one another when closely examined. The current phrase "double personality" is only an abstraction: once translated into the language of concrete facts, of authentic observations, it is seen to comprise all sorts of diversity. Each case, so to speak, requires a special interpretation. *A priori*, the special interpretation might be found. If, as we hold and as we will try to show as we proceed, personality is a highly complex composite, plainly its perturbations must needs be multiform. Each separate case shows it to us broken up in a different way. Here disease becomes a subtile instrument of analysis; it makes for us experiments not to be had otherwise. The difficulty is to interpret them aright; but our very mistakes can lead us astray only for a moment, for the facts the future will develop will serve to correct our conclusions or to verify them.

The province of the physical personality as an element of the total personality is so important a one and has been so overlooked, often on purpose, that we can hardly lay too much stress upon it. Here we may with some advantage study certain rare cases little regarded by psychologists, but which bring to the support of our thesis some additional facts not more conclusive than those already cited, but more striking: I mean cases of double monsters.

It must be confessed that the number of such cases is rather small. Nature does not multiply monsters, and of the seventy or eighty species defined by teratologists the major part have no interest for us. Furthermore, of double monsters many fail to reach adult age. The anatomist and the physiologist may study these with profit, not so the psychologist. Finally, accurate observations on this matter date back hardly one hundred years. Observations of an earlier date are so tinged with credulity and so imperfectly recorded as to be of no value.

The Me, as has oft been repeated, is impenetrable: it forms in itself a perfect whole strictly limited—and this is a proof of its essential oneness. This statement is indisputable, nevertheless the impenetrability of the Me is only the subjective expression of the impenetrability of the organism. One personality cannot be another personality, just because one organism cannot be another organism. But if through a concurrence of causes that need not be enumerated, two human beings from the fœtal period be partially united, the heads—the essential organs of human individuality—remaining perfectly distinct, then what happens is this: each organism is no longer completely limited in space and distinct from every other; there is an undivided ownership, common to both, of a part of the economy, and if, as we maintain, the unity and the complexity of the Me are but the subjective expression of the unity and the complexity of the organism, then there must be partial penetration of one personality by the other, and a portion of the common psychic life must be common to the two, belonging not to a *Me*

* Leuret, *Fragments Psychologiques sur la Folie*, p. 95.
† Gratiolet, *Anatomie Comparée du Système Nerveux*, tome 2, p. 548.

but to a *We*. Each individual here is a little less than an individual. This inference is fully confirmed by experience.

"Anatomically considered, a double monster is always more than a unitary individual and less than two, but in some cases it comes nearer to unity, in others to duality. So too, physiologically considered, it always has more than a unitary life, and less than two lives; but its twofold life may approach nearer to unity on the one hand or on the other to duality.

"If we consider only the phenomena of sensibility and of will, a monster made up of two nearly perfect individuals joined only at one point of their bodies will be twain mentally and morally as well as physically. Each individual will have its own sensibility and its own will, and these will have relation to its own body and to that alone. It may even happen that the twins will differ widely in their physical constitution, their stature, their physiognomy, and not less widely in personal character and intelligence. When one is happy the other may be sad; one will be wakeful while the other sleeps; or one will want to walk while the other prefers to rest: and out of this conflict of two wills governing two indissolubly united bodies may come movements without results and that are neither walking nor resting. The two moieties may quarrel with each other, or come to blows. . . . Thus their moral duality, a consequence of their physical duality, will be demonstrated in a hundred ways; nevertheless, as there is a point in the double body situate on the dividing line between the two individuals and common to both, certain other phenomena not so numerous, demonstrate in them a beginning of unity.

"Impressions made upon the region where the two are united, especially at its central point, are perceived simultaneously by both brains, and both, too, may react in response to them. . . . We may add that if at times the peace between the twins is disturbed, there exists between them nearly always a harmony of feelings and desires and a mutual sympathy and attachment that can hardly be appreciated by one who has not read all the testimony.

"Phenomena of the same and of a different kind are seen in cases where, the union becoming closer, the two heads have between them only one body and one pair of legs. Anatomic analysis shows that in such creatures each individual possesses as his own one side of the one body and one of the two legs. Physiological and psychological observation fully confirms this singular result. Impressions made along the whole length of the axis of union are perceived simultaneously by both the heads; those made on either side of the axis and at some distance from it are perceived by one head only; and the same is true of the will as of sensations. The brain to the right will alone receive sensations through the right leg and it alone will act upon that leg, while the brain to the left will alone act on the left leg: so that the act of walking will be the result of movements performed by two limbs belonging to two different individuals, and coördinated by two distinct wills.

"Finally, in parasital monsters, as the organization is here nearly unitary, all the vital acts, all the sensations, all the manifestations of will take place almost exactly as in normal beings. The smaller of the two individuals, having become an accessory and inactive part of the larger, exerts upon him only a weak and limited influence and that only in a very small number of functions."*

To these general outlines I will add a few details taken from the most famous instances of double monstrosity.

There are a good many documents extant relating to Helen and Judith, a dual female monster born at Szony, Hungary, in 1701, deceased at Presburg aged twenty-two years. Helen and Judith stood nearly back to back, being united at the nates and partly in the lumbar region. The sexual organs were double externally, but there was only one womb; there were two intestinal canals opening into one anus. The two aortas and the two inferior venæ cavæ were united at their extremities, thus opening two wide and direct communications between the two hearts: from this resulted a semi-community of life and function.

"The sisters had neither the same temperament nor the same character. Helen was taller, handsomer, more sprightly, more intelligent and more amiable in disposition than her sister. Judith, stricken at the age of six years with hemiplegic paralysis, was always smaller and of less active mind. She was slightly deformed, and her speech somewhat impeded. Still, like her sister, she spoke the Hungarian, German, French, and even a little English and Italian. The sisters were tenderly affectionate to each other, though in childhood they sometimes quarreled and even came to blows. The calls of nature came to both simultaneously, except as regarded urination. They had the measles and later the small-pox simultaneously, and whenever it happened that only one of the sisters was ill of any complaint, the other would be miserable and worried. At last Judith was taken with a brain trouble and an affection of the lungs. Helen, who for a few days had suffered from a slight fever, almost instantly lost all her strength, though her intellect remained clear and her power of speech unimpaired. After a brief agony she

* Isidore Geoffroy Saint-Hilaire, *Histoire des Anomalies*, tome 3, p. 373. The monster known as "Home's epicome" had a parasitic head which presented but a very imperfect semblance of normal life.

succumbed, not to her own ailment but to those of her sister. The twins expired at the same instant."

The Siamese Twins, Chang and Eng, born in 1811 in the kingdom of Siam, were connected from the navel to the xiphoid appendix. I. G. de Saint-Hilaire, after describing their outward *habitus*, adds that,

"The two brothers, even in their other functions [besides respiration and the arterial pulsation] exhibit a concordance that is remarkable, though not absolutely constant as has been affirmed, and as Chang and Eng themselves have been wont to assure those who went no farther than to put to the twins a few vague questions. No doubt there is nothing more curious than the contrast of almost complete physical duality with absolute moral unity—but there is nothing so opposed to sound theory. I have carefully made every observation, and gathered all the information that could help me to determine the truth of what has been so often asserted, and I have found that, in this conflict between the ill-understood principles of teratology and the many physiological doctrines that have been based on the unity of the Siamese brothers, the facts, as was to have been expected, are entirely in favor of the former. These twin brothers, cast in two nearly identical moulds, of necessity subject throughout their lives to the influence of the same physical and moral environment, having a similar organization and receiving the same education, present the spectacle of two creatures whose functions, actions, words, whose very thoughts are nearly always concordant and parallel. Their joys, their sorrows, are in common: the same desires arise at the same instant in these twin souls, the sentence that is begun by one is often completed by the other. Nevertheless these concordances prove parity, not unity. Twins in the normal state often exhibit analogous concordances, and no doubt they would present agreements quite as remarkable if they had during their whole lives seen the same objects, experienced the same sensations, shared in the same pleasures, undergone the same sufferings." *

And I may add that as the Siamese twins grew older, their differences of character became more and more pronounced: one of the latest observers describes one of the brothers as morose and taciturn, the other as sprightly and cheerful.

Inasmuch as the present work is not intended to be a Psychology of Double Monsters, which find a place in this treatise only as instances of deviation of personal identity, I shall simply mention the recent case of Millie and Christine, in whom the sensibility of the lower members is in common; consequently the two spinal cords must form a regular chiasma at the point of union.

The law, both civil and ecclesiastical, takes cognizance of this phenomenon of double monsters, as involving questions of civil status, marriage, right of succession, baptism, etc.; it has unhesitatingly recognized two persons wherever such monsters present two distinct heads. And justly so, though in practice embarrassing questions may arise. The head being in man the true seat of personality and the place where the synthesis of personality takes place—though this does not appear so certain as we descend the animal scale—it fairly stands for the individual. But when the question is discussed scientifically it is impossible, in the case of double monsters, to consider each individual as complete.

I will not weary the reader with unnecessary comments, since the facts speak for themselves. Whoever examines attentively what has been said, will see that even in cases where the personalities are most distinct, there is such a blending of organs and functions that each of the twins can be himself only by being more or less the other and by having consciousness of that other.

The Me therefore is not an entity that acts where and how it pleases, controlling the organs in its own way, limiting its own province at will. On the contrary it is so truly a resultant that its domain is strictly determined by its anatomical connections with the brain, and that it represents, now a complete body less some undivided part, again a part of a body and, in the case of parasital monsters, so small a part that it cannot subsist, and becomes aborted.

To prove once more and in another way that the organism is the principle of individuation; and that it is such without any restriction, directly through the organic sensations, indirectly through the affective and intellective states of which we shall speak later; let us see what takes place in twins. Psychology has hardly concerned itself about twins any more than about double monsters, but biologists have brought to light some curious facts.

First it is to be remarked that double

* *Hist. des Anomalies*, tome 3, p. 90, et seq.

births occur in the ratio of about one to seventy normal births. Triple and quadruple births are far more infrequent—as one to 5000 and one to 150,000 respectively: but we will consider here only cases of twin births, for the study of triple and quadruple births would only complicate matters. Again, it is to be remarked that there are two kinds of twins, coming each from a separate ovum, and in such cases they may be of the same or of different sex; or from two germinative spots in one ovum, and then they are enveloped in the same membrane and are invariably of one sex. This latter case alone gives us two personalities strictly comparable.

We will not take account of animals, but will consider the human species only, and will attack the problem in all its complexity. It is evident that since the physical and the moral state of the parents is the same for the two individuals at the instant of procreation, one cause of difference is eliminated. And as their development has for its starting point one single fecundated ovum, it is highly probable that there will be an exceedingly close resemblance between the two in physical constitution, and hence, according to our thesis, in mental constitution. Let us first see what are the facts in our favor; we will then consider objections and exceptions.

Perfect likeness between twins is a matter of every-day observation. In ancient times it was turned to account by comic poets, and ever since novelists have made use of it. But usually they have dealt only with external resemblances, as stature, figure, features, voice. There are resemblances far deeper than these. Physicians have for a long time remarked that most twins exhibit an extraordinary agreement in tastes, aptitudes, faculties, and even in their fortunes. Mr. Galton has investigated this subject by sending out a list of questions to which he received eighty replies whereof thirty-six entered into circumstantial details. Mr. Galton's purpose was entirely different from ours. In pursuing his researches on heredity he wished to determine by a new method the respective parts played by nature and education; but much of his material will be of great use to us.*

He gives many anecdotes of the same character as those which have long been current, *e. g.*: one sister taking two music lessons a day so as to leave her twin sister free; the perplexities of a college janitor who whenever the twin brother of one of the students came to see his brother, was at a loss which of the two to let out, etc. In other cases the twins exhibit a persistent likeness to each other under circumstances little calculated to preserve it. Thus:

"A was coming home from India on leave; the ship did not arrive for some days after it was due; the twin brother B had come up from his quarters to receive A, and their old mother was very nervous. One morning A rushed in saying, 'Oh, mother, how are you?' Her answer was, 'No, B, it's a bad joke. You know how anxious I am'—and it was a little time before A could persuade her that he was the real man." †

But facts regarding mental organization have more interest for us. "The next point," says Galton,

"which I shall mention in illustration of the extremely close resemblance between certain twins is the similarity in the association of their ideas. No less than eleven out of the thirty-five cases testify to this. They make the same remarks on the same occasion, begin singing the same song at the same moment, and so on; or one would commence a sentence and the other would finish it. An observant friend graphically described to me the effect produced on her by two such twins whom she had met casually. She said: 'Their teeth grew alike, they spoke alike and together, and said the same things, and seemed just like one person. One of the most curious anecdotes that I have received concerning this similarity of ideas was that one twin, A, who happened to be at a town in Scotland, bought a set of champaign glasses which caught his attention, as a surprise for his brother B, while at the same time, B, being in England, bought a similar set of precisely the same pattern for A. Other anecdotes of a like kind have reached me about these twins.'" ‡

Bodily and mental diseases, in themselves and in their evolution, supply many confirmatory facts. And though the latter are of interest only to the psychologist, the former disclose a likeness in the inmost constitution of the two organisms not to be seen at a glance like external resemblances. Says Trousseau:

"I have had as patients twin brothers that were so extraordinarily alike that it was

* See the title "History of Twins" in Galton's *Inquiries into Human Faculty and its Development.*

† Galton, *Inquiries into Human Faculty.* (London, 1883), p. 224.

‡ *Ibid.*, p. 231.

impossible for me to distinguish them except when they were side by side. This bodily resemblance went further still: there was even a more remarkable pathological likeness between them. One of them, whom I saw in Paris suffering from rheumatic ophthalmia, said to me: 'This very moment my brother is no doubt suffering from ophthalmia too.' I scouted the idea, but a few days afterward he showed me a letter he had just received from his brother, then at Vienne, in which he wrote: 'I have my ophthalmia, you too must be having yours.' Strange as this may seem, the fact was even so. This I have not on hearsay, but I myself have seen it, and similar cases have come to my knowledge in my practice." *

Galton gives many similar cases, but I quote only one. Two twins bearing a perfect resemblance to each other, with a strong mutual attachment and with identical tastes, were in government employ, and lived together. One fell sick of Bright's disease and died; the other was attacked by the same disorder and died seven months later.

Pages might be filled with similar cases. And it is the same with mental maladies. A few instances will suffice. Moreau of Tours had under treatment two twins physically alike and both insane. In them

"the dominant ideas are absolutely the same. Both believe themselves to be the victims of imaginary persecutions. The self-same enemies have sworn to undo them and employ the self-same means of attaining their ends. Both have hallucinations of hearing. They never address a word of conversation to any one, and are loth to answer questions. They always hold themselves aloof and do not communicate with each other. An exceedingly curious fact, and one again and again noticed by the attendants in their ward and by ourselves is, that from time to time, at very irregular intervals—two, three or more months—without ascertainable cause and by a spontaneous effect of their complaint, a very marked change occurs in the condition of the two brothers. Both of them, about the same period, often on the same day, quit their habitual state of stupor and prostration; they utter the self-same complaints and present themselves before the physician, earnestly begging to be allowed their liberty. I have been witness of this rather singular fact even when the twins happened to be several kilometers apart, one at Bicêtre, the other at the Ste. Anne farm." †

Recently the *Journal of Mental Science* published two observations on insanity in twins. Here we see two sisters much alike in features, manners, speech and mental traits, so that they might easily be taken for one another. They were placed in different wards of the same asylum without the possibility of seeing one another, and yet the symptoms of insanity were the same in both.

But we must meet some objections. There are some twins of one sex who do not resemble each other, and though the observed facts do not tell us in what proportion true twins (from one ovum) present these differences, one instance suffices to make the subject worthy of discussion. We have in another place ‡ enumerated the many causes that in every individual, from conception till death, tend to produce variations, that is to say marks proper to that individual and differentiating him from all others. Here, as we have said, one class of causes must be eliminated, viz., those which come immediately from the parents. But the fecundated ovum represents also the ancestral influences—four, twelve, twenty-eight possible influences, accordingly as we go back to the grand-parents, great-grand-parents, great-great-grand-parents, and so on. Only by experience do we learn which influences prevail and in what degree. Here indeed one same ovum serves to produce two individuals; but there is nothing to prove that always and everywhere division is made between the two with strict equivalence in quantity and quality of the materials. The ova of all animals not only possess the same anatomic composition, but furthermore chemical analysis can discover in them only infinitesimal differences; nevertheless one ovum produces a sponge, another a human being. It follows that this apparent likeness hides profound differences which our keenest investigation fails to detect. Are these differences due to the nature of the molecular motions, as some authors think? We may suppose what we please, provided it be understood that the ovum is a complex product, and that the two individuals that come from it may not be rigorously alike. Our difficulty springs simply from ignorance of the processes according to which the primordial elements group themselves

* Trousseau *Clinique Médicale* I., p. 253.

† *Psychologie Morbide*, p. 172. See also an exceedingly curious case in the *Annales Médico-psychologiques*, 1863, tome I., p. 312. On the question of twins the reader may consult Kleinwaechter's special work, *Die Lehre von den Zwilligen*. Prag, 1871; also Dr. B. Ball, *Insanity in Twins* (HUMBOLDT LIBRARY, No. 87, page 37).

‡ *L'Hérédité Psychologique*, 2d edition, part II., ch. iv.

in order to constitute each individual, and consequently from our ignorance of the physical and psychical differences thence resulting. Some of Galton's correspondents mentioned the curious fact of some twins being "complementary to each other." The mother of a pair of twins wrote:

"There seemed to be a sort of interchangeable likeness in expression that often gave to each the effect of being more like his brother than himself."* "A fact struck all our school contemporaries, that my brother and I were complementary, so to speak, in point of ability and disposition. He was contemplative, poetical, and literary to a remarkable degree, showing great power in that line. I was practical, mathematical, and linguistic. Between us we should have made a very decent sort of a man."†

If the reader will consider how complex man's psychic organization is, and, in consequence of this complexity, how unlikely it is that two persons should be simply copies of each other, he will be inevitably led to the conclusion that one well-proved fact of this kind outweighs ten exceptions, and that the moral likeness is only the correlative of the physical. If *per impossibile* there were two men so constituted that their organisms should be identical, and their hereditary influences exactly the same: if *per impossibilius* both of them received the same physical and moral impressions at the same moment: then the only difference between them would be their position in space.

In concluding this chapter, I am a little ashamed to have collected so many proofs and arguments to establish what in my eyes is a plain truth, viz., that as the organism is, so is the personality. I should have hesitated to do it, were it not that this truth has been forgotten and misconceived rather than denied, and that authors have nearly always contented themselves with mentioning it under the vague heading of "influence of the physical upon the moral."

The facts so far studied do not of themselves lead to a conclusion: they only prepare the way. They prove that physical personality presupposes the properties of living matter and their coördination; that as the body is but the organized and coördinated sum of the elements that make it up, so the psychical personality is but the organized and coordinated sum of the same elements regarded as psychic values. It expresses their nature and their action, nothing more. This is proved by the normal state, by teratological cases, and by the likeness between twins. The aberrations of physical personality, or as Bertrand ‡ happily denominates them, "hallucinations of the bodily sense" (*les hallucinations du sens du corps*) confirm this view. But there are deviations of human personality produced by other causes, by a more complex mechanism: these we are now to study.

* *Inquiries into Human Faculty*, p. 224.
† *Ibid.* p. 240.

CHAPTER III.

AFFECTIVE DISTURBANCE.

ONCE for all the reader must be reminded that in this chapter (as also in the one on intellective disorders) we are still pursuing, under another form, the study of organic conditions. The desires, feelings, passions that give the fundamental tone to character, have their roots in the organism, are pre-determined by it. The same is true of the highest intellectual manifestations. Nevertheless since the psychic states have here a predominant *rôle*, we will treat them as immediate causes of changes of personality, the while never forgetting that these causes are in their turn themselves effects.

Without pretending strictly to classify affective manifestations (which we shall not have to consider in detail) we will reduce them to three groups of increasing psychological complexity but decreasing physiological importance. These are 1. Tendencies connected with the conservation of the individual (nutrition, defense); 2. Those which relate to the conservation of the species; and 3. The highest of them all, those which presuppose the development of mind (manifestations of a moral, religious, æsthetic, or scientific kind; ambition in all its forms; and the like). If we consider the development of the individual we find that it is in this order that feelings and sentiments make their appearance. It is seen more clearly still in the evolution of the human species. The inferior races, where education does not come in to correct nature, when they bring together the accumulated result of ages of labor, have little to show beyond the conservation of the individual

‡ *De l'Aperception du Corps Humain par la Conscience*, p. 269, *et seq.*

and of the species, and present only the faintest trace of the sentiments enumerated under the third head.

The affective states relating to nutrition are, in the child during its early years, the only element, so to speak, of the nascent personality. From these come well-being and discomfort, desire and aversion: here we see that "bodily sense," of which we have spoken so often, arrived at its highest psychic expression. Inasmuch as certain natural causes, too evident to need enumeration, make nutrition the almost exclusively dominant concernment in the infant, the babe has and can have only an almost entirely nutritive personality, *i. e.*, the vaguest and lowest form of personality. The Me, in the view of whoever does not consider it as an entity, cannot be here anything but an extremely simple composite.

As we quit the period of infancy, nutrition plays a less dominant part, but it never loses its just place, for, of all the properties of the living being, this one alone is fundamental. Hence with variations in nutrition are connected serious alterations of personality. With nutrition reduced, the individual feels himself depressed, enfeebled, diminished. With nutrition increased, he feels himself stimulated, strengthened, reinforced. Of all the functions whose harmonious action constitutes this fundamental property of living beings, the circulation appears to be the one whose sudden variations have the greatest influence upon the affective states, and are most speedily answered by a counter-stroke. But we must quit conjectures about details, and look at the facts.

In the states known as hypochondria, lypemania, melancholia (in all its forms), we find alterations of personality ranging through all possible degrees, including complete metamorphosis. Physicians draw lines of clinical distinction between these different morbid states, but they do not concern us just now, and we may comprise them under one common description. There is a certain feeling of fatigue, oppression, anxiety, down-heartedness, sadness, absence of desire, persistent *ennui*. In the worst cases, the springs of the emotions are quite dried up, "The patients become insensible to everything. They are without affection, whether for their parents or for their children, and even the death of those who once were dear to them leaves them utterly cold and indifferent. They can no longer weep, and nought save their own sufferings moves them."* Then, as regards bodily or mental activity: such patients exhibit torpor, powerlessness to act or even to will, insuperable inaction for hours at a time: in a word that "abulia" all the forms of which we studied in the work on *Diseases of the Will*.† As regards the outer world, the patient, though not hallucinated, finds all his relations to it changed. His habitual sensations seem to have lost their usual character. "Everything about me," said such a patient, "is still as it used to be, yet there must have been some changes. Things still wear their old shapes: I see them plainly, and yet they have changed a good deal too." One of Esquirol's patients complained "that his existence was incomplete. 'Every one of my senses,' he used to say, 'every part of myself is, so to speak, separated from me, and no longer gives me any sensation: it seems to me that I never come quite up to the things I touch.'" This state, due sometimes to cutaneous anæsthesia, may become so intensified that to the patient "it seems as though the real world had completely vanished or is dead, and that only an imaginary world remains in which he is anxious to find his place."‡ To all this, add the physical symptoms, viz., disordered circulation, respiration, and secretion. There may be great emaciation, and the weight of the body may decline rapidly during the period of depression. The respiratory function is retarded as also the circulation, and the body's temperature is lowered.

By degrees these morbid states become embodied, organized, and combine to produce a false conception which becomes a center of attraction toward which everything converges. One patient avers that his heart is a stone, another that his nerves are burning coals; and so on. These aberrations have all sorts of forms, and they differ from one patient to another. In extreme forms, the individual doubts of his own existence, or denies it. A young man who said he was for two years dead, expressed as follows his perplexity: "I exist, but outside of real, material life, and in spite of myself, nothing having given me death. Everything is mechanical with me, and everything is done unconsciously." This contradictory situation, in which the subject says that

* Falret, *Archives Générales de Médecine*, Dec., 1878.

† No. 52 Humboldt Library.

‡ Griesinger, *Traité des Maladies Mentales* (French Trans.), p. 265.

he is at once living and dead, would seem to be the logical, natural expression of a condition of things in which the former Me and the present Me, vitality and annihilation, come to equilibrium.

The psychological interpretation of all these cases admits of no doubt: here are organic perturbations whose first result is to reduce the sense-faculty in general, and whose second is to pervert it. Thus is found a group of organic and psychic states that tend to modify the constitution of the Me profoundly and in its inmost nature, because they act not after the manner of sudden emotions whose effect is violent and superficial, but slowly, silently, persistently. At first, this new state seems strange to the individual, something outside of himself. Little by little, through custom, it finds its place, becomes an integral part of the individual's being, and, if it is progressive, transforms him entirely.

Seeing how the Me is broken up, we can understand how it comes to be. Doubtless, in most cases, the change is only partial. The individual, while becoming for himself and for those who know him, other than he used to be, retains a residuum of himself. Complete transformation can, in fact, be only of rare occurrence; and it may be remarked that when the patient says he is changed, transformed, despite the contradiction or the ridicule of his friends, he is right and not they. He cannot feel otherwise, for his consciousness is but the expression of his organic state. Subjectively, he is not at all under an illusion: he is just what he must be. On the contrary it is the unconscious, unavowed hypothesis of a Me, independent and existing by itself as an unchangeable entity, that instinctively leads us to believe this change to be an external occurrence—or, as it were, some unwonted or ridiculous garb, while the fact is that the change is inward and involves gains or losses in the very substance of the Me itself.

The counterpart of these partial alterations of the Me is seen in cases where it becomes exalted, amplified, and where it immeasurably transcends its normal tone. Instances of this are seen in the beginning of general paralysis; also in certain cases of mania. This is in every respect the reverse of what occurs in those other cases. Here we see the patient possessed of a sense of physical and mental well-being, of abounding strength, of exuberant activity. he talks unceasingly, is a fertile deviser of projects and undertakings, ever traveling hither and thither to no purpose. The superexcitation of his psychic life has a corresponding superactivity of the organic functions. Nutrition becomes more active and is often excessive; respiration and circulation are accelerated; the genital function is quickened. Yet, despite the great expenditure of force, the patient feels no fatigue. Then these states become grouped and unified, and at length they in great part transform the Me. One man is conscious of herculean strength, is able to lift prodigious weights, to beget thousands of children, run a race with a railroad train, etc. Another possesses an inexhaustible store of science, is a great poet, great inventor, great artist, and so on. Sometimes the transformation comes still nearer to complete metamorphosis: mastered by the sense of boundless power, the patient calls himself pope, emperor, god. As Griesinger justly remarks,

> "The patient feeling proud, daring, light hearted, conscious to himself of unwonted freedom in executing his projects, his mind swarming with ideas, is naturally led to conceive thoughts of greatness, station, wealth, great moral or intellectual power. * * * This overweening sense of strength and freedom must however have a reason: there must exist in the Me something to correspond to this; the Me must have become for the time being something quite different from what it was before, and this change can be expressed by the patient only by declaring himself to be Napoleon, the Messiah, or some other exalted personage."*

We will not waste time in proving that this transformation of the Me, whether, partial or complete, momentary or permanent, is in kind the same as the preceding cases and that it presupposes the same mechanism. with this only difference, that here the Me undergoes dissolution in the reverse way, by excess, and not by default.

These *plus* or *minus* alterations of personality, this metamorphosis of the Me, which raises it or lowers, would be still more striking if they succeeded one another regularly in the same individual. Now this occurs often in what is called *folie circulaire*, or *folie à double forme*, a malady characterized essentially by successive periods of depression and exaltation following one another in fixed order, with intermissions of lucidity in some patients. Here we observe a curious fact. Upon the personality that may be called

* *Op. cit.*, p. 333.

the original and fundamental one, are grafted, one after the other, two new personalities not only quite distinct, but totally exclusive of each other. Upon this point it is necessary to give the gist of a few observations.* A woman whose case was observed by Morel, had been abandoned to a vicious life by her mother from the age of fourteen years.

"Later, in her shame and wretchedness, her only resource was to enter a brothel. She was taken thence one year afterward and placed in the convent of the Good Shepherd at Metz. Here she stayed two years, and the too strong reaction that took place in her feelings gave rise to religious mania, which was followed by a period of profound stupidity."

Being now placed under the care of a physician, she would pass through two alternate periods, believing herself to be in turn prostitute and nun. On emerging from the period of stupidity,

"she would go to work regularly, and her language was always proper, but she would arrange her toilet with a certain *coquetterie*. Then this tendency would increase, her eyes growing brighter, her glance lascivious; she would dance and sing. At last her obscene language and her erotic solicitations would compel her sequestration in solitary confinement. She would say her name was Madame Poulmaire, and would give the fullest details of her former life in prostitution. Then, after a period of depression, she would become again gentle and timid, carrying even to scrupulousness the sense of propriety. She would now arrange her toilet with the utmost austerity. The tone of her voice too would assume a peculiar character, as she spoke of the Good Shepherd convent at Metz and of her longing to return thither. Now her name would be Sister Martha of the Five Wounds, Theresa of Jesus, Mary of the Resurrection, etc. She would not speak in the first person singular, but would say to the attendant sister, 'Take *our* dress'; 'there is *our* handkerchief.' Nothing was her own any more, according to the rule in convents. She would have visions of angels smiling upon her, and moments of ecstasy."

In a case reported by Krafft-Ebing, a neuropathic patient, son of an insane father, "during the period of depression was disgusted with the world, and all his thoughts were about the nearness of death, and about eternity, and his purpose then was to become a priest. During his maniacal periods he was noisy, pursued his studies with mad ardor, would not hear of theology, and thought only of practicing medicine."

An insane woman at Charenton, possessing very remarkable power and originality of mind,

"from day to day would change in personality, in condition, in life, and even in sex. Now she would be a young lady of blood royal betrothed to an emperor; anon a plebeian woman and a democrat: to-day a wife and in the family way; to-morrow still a maid. It would happen also that she would think herself a man, and one day she imagined herself to be a political prisoner of importance, and composed some verses upon the subject."

Finally in the observation which follows we find the complete formation of a second personality.

"A lunatic in the Maison de Vanves," says Billod,† "about every eight months would let his beard grow and would show himself to all the inmates in unusual garb and with unwonted behavior, giving himself out to be one Nabon, an artillery lieutenant lately returned from Africa to take the place of his brother. The patient would then remain several months in a state of great exultation, adapting all his conduct to his new character. After some time he would announce the return of his brother who, he would say, was in the village and was now to take his place. Then some day he would have his beard shaved off, would make a complete change in his habits and demeanor, and would resume his true name. But now he would present all the signs of melancholia, walking about slowly, loving silence and solitude, continually reading the *Following of Christ* and the *Fathers of the Church*. In this mental state, a lucid one if you please, but one that I am far from considering as normal, he would remain till the coming back of 'Lieutenant Nabon.'"

The two cases first cited are, in reality, but an exaggeration, a largely magnified copy, so to speak, of the normal state. The Me is always made up of contradictory tendencies—virtues and vices, modesty and arrogance, avarice and prodigality, desire for rest and need of action, and so on. Usually these opposite tendencies equilibrate one another, or at least the one which dominates is not without its counterpoise. In the cases before us, in virtue of pretty well ascertained organic conditions, not only is equilibrium impossible, but a group of tendencies becomes hypertrophied at the expense of the antagonist group, which becomes

*They can be found *in extenso* in Ritti, *Traité Clinique de la Folie à Double Forme*. Paris, 1883. Obs. XVII., XIX., XXX., XXXI.

† *Annales Médico-psychologiques*, 1858.

atrophied; then an inverse reaction takes place, so that the personality, instead of consisting of those mean oscillations whereof each one represents one side of human nature, passes ever from one excess to another. We may remark that these diseases of personality consist of a reduction to a simpler state: but we must not yet dwell upon that point.

Nutrition being less a function than the fundamental property of whatever has life, the tendencies and the feelings connected with it possess a very general character. The same cannot be said of what concerns the conservation of the species. That function, attached as it is to a definite part of the organism, finds expression in very definite feelings. Hence this is well fitted to verify our thesis; for if personality is a composite varying according to its constituent elements, a change in the sex instincts will change the personality, a perversion will pervert it, an interversion will intervert it: and this is just what happens.

First let us recall some known facts, though commonly the conclusions they enforce are not drawn. At puberty a new group of sensations and consequently of feelings, sentiments and ideas comes into existence. This influx of unwonted psychic states—stable because their cause is stable, coördinated to one another because their source is one—tends profoundly to modify the constitution of the Me. It feels undecided, troubled with a vague and latent unrest whose cause is hid. Little by little these new elements of the moral life are assimilated by the existing Me, enter into it, are converted into it, withal making it other than it was. It is changed; a partial alteration of the personality has taken place, the result of which has been to produce a new type of character—the sexual character. This development of an organ and of its functions, with their train of instincts, imaginings, feelings, sentiments and ideas, has produced in the neuter personality of the child a differentiation—has made of it a Me male or female, in the complete sense of the term. Till now there existed only a sort of rough draft [*ébauche*] of the complete personality, but that has served to obviate all sudden shock in the change, to prevent a rupture between the past and the present, to make the personality continuous.

If now we pass from the normal development to exceptional and pathological cases, we shall find variations or transformations of personality dependent on the state of the genital organs.

The effect of castration upon animals is well-known. Not less known is its effect upon man. A few exceptions apart (and such are found even in history) eunuchs present a deviation from the psychic type. "Whatever we know about them," says Maudsley, "confirms the belief that they are for the most part false, lying, cowardly, envious, revengeful, void of social and moral feeling, mutilated in soul as well as in body." Whether this moral degradation be the direct result of castration, as some authors assert, or whether it result from an equivocal social situation, is a question that does not affect our thesis: whether the result comes directly or indirectly from the mutilation, the cause remains the same.

As regards hermaphrodites experience verifies what we might have predicted *a priori*. With the characteristics of one sex they present some of those peculiar to the other, but instead of combining the functions of both, they possess only imperfect organs, and commonly these are sexually impotent. The moral character of hermaphrodites is sometimes neutral, again masculine, in other cases feminine. Abundant instances are cited by writers who have treated the question.* "Sometimes the hermaphrodite, after having shown a very strong liking for women, is animated with the very opposite instincts by the descent of the testicles." In a case recently observed by Dr. Magitot an hermaphrodite woman successively manifested feminine tastes and very pronounced masculine appetites. "In general the affective faculties and the moral dispositions show the effects of the malformation of the organs. Nevertheless, it is but fair" says Tardieu, "to make large allowance for the influence of the habits and occupations imposed upon these individuals by the error as to their real sex. Some of them being from the first educated as girls, dressed as girls, employed in women's work, married perhaps as women, retain the thoughts, the habits, the demeanor of the female sex. Such was the case with Maria Arsano, deceased at the age of eighty years, who was in fact a man whose character had been made feminine by habit."

I do not propose here to detail the

* For the facts see Isidore Geoffroy Saint-Hilaire *Histoire des Anomalies* vol. II., p. 65, *et seq.* Also Taraieu and Laugier, *Dictionnaire de Médecine*, art. HERMAPHRODISME.

perversions or aberrations of the sexual instinct, * each one of which imprints its mark upon the personality, altering it more or less, transiently or permanently. These partial alterations reach their term in total transformation, in change of sex. There are many instances of this: the following may serve as a type. Lallemant records the case of "a patient who believed himself to be a woman, and who wrote letters to an imaginary lover. At the autopsy there was found an hypertrophy with induration of the prostate, and an alteration of the ejaculatory canals." It is probable that in many cases of this kind there has been perversion or abolition of the sexual feelings.

Some exceptions, however, are to be noted. From sundry detailed observations (which see in Leuret, *Fragments Psychol.*, p. 114 *et seq.*) we learn of individuals who assume the gait, the habit, the voice, and, as far as they may, the garb of the sex they imagine themselves to belong to, though they present no anatomical or physiological anomaly of the sexual organs. In such cases the starting point of the metamorphosis is to be sought elsewhere: it must be found in the cerebro-spinal organ. Indeed when we speak of the sexual organs as constituting or as modifying personality, we are to be understood as speaking, not of those organs themselves alone as defined by their anatomic conformation, but also of their relations to the encephalon, in which they are represented. Physiologists locate in the lumbar region of the spinal column the reflex genito-spinal center. From that center to the brain all is undiscovered territory; for the hypothesis of Gall, who made the cerebellum the seat of physical love, is not much in favor, despite the confirmatory observations of Budge and of Lussana. But however great our ignorance upon this point, sexual impressions must reach the encephalon, for they are felt, and there are centers from which psychic incitations are sent out to the sexual organs to put them in action. These nerve-elements, whatever their nature, their number, or their seat; whether they are localized or diffused, are the cerebral, and consequently the psychic, representatives of the sexual organs; and since in producing a special state of consciousness they usually produce others also, there must be some association between this group of psycho-physiological states and a certain number of others. The conclusion to be drawn from the cases already cited, is that there has arisen a cerebral disorder of unknown character (a woman supposing herself to be a man, or *vice versa*) whence results a fixed erroneous state of consciousness. This fixed state of consciousness, predominating over the normal states, calls forth natural, almost anatomical associations, which are as it were its radiations (the feelings, the ways, the speech, the dress of the imaginary sex): it tends to complete itself. Here is a metamorphosis from above not from below; and here we have an instance of what is called the influence of the moral upon the physical. We will endeavor to show further on that the Me upon which most psychologists have based their reasonings is formed by a like process. Further these cases belong among the *intellective* deviations of personality, of which we shall treat in the next chapter.

Before we quit this subject, I would notice a few facts hard to account for, but which nevertheless cannot be seriously alleged against our thesis. I refer to the phenomenon of "opposite sexuality" [*sexualité contraire*] often mentioned of late, and about which a few words will suffice. Certain patients observed by Westphal, Krafft-Ebing, Charcot and Magnan, Servaes, Gock, *et al.*, present a *congenital* introversion of the sexual instinct, whence results, despite their normal physical constitution, an instinctive and violent attraction to a person of the same sex, with strong repulsion toward the opposite sex: in short, "a woman will be a woman physically but psychically a man: a man will be physically a man, psychically a woman." These facts are entirely at variance with what logic and experience teach us: here the physical and the moral are in mutual contradiction. Strictly speaking, those who regard the Me as an entity might quote these facts as proving its independence, its autonomous existence. Nevertheless that were a gross illusion, for their whole argument would rest upon two very weak bases, viz., on some facts of very rare occurrence, and on the present difficulty of finding an explanation of them. No one will deny that cases of "opposite sexuality" are but an infinitesimal faction of the sum of the cases known to us by experience. By their rarity they form an exception, and by their nature a psychological monstrosity: but monstros-

* For a full discussion of this question see the article by Dr. Gley, "Sur les Aberrations de l'Instinct Sexuel" in the *Revue Philosophique*, Jan. 1884.

ities are not miracles, and it behooves us to find out whence they come.

We might attempt to account for them in many ways, but that usually means that no explanation is sufficient. I will not inflict these explanations upon the reader. Like every other science, psychology must be resigned to be ignorant for a time, and must not fear to confess ignorance. Herein it differs from metaphysics, which undertakes to explain all things. Physicians who from their own medical point of view have studied these strange creatures, regard them as degenerate individuals. The point of special interest for us would be to know why degenerescence takes this form and not another. Probably the explication of this mystery is to be sought in the multiple elements of heredity, in the complex play of the conflicting male and female elements: I leave the question to minds more clear-sighted and more fortunate in discovering the causes of things. But aside from the question of the cause, one can hardly refuse to recognize a deviation of the cerebral mechanism, as in the cases quoted by Leuret, and in like instances. But the influence of the sexual organs upon the nature and formation of character is so little open to question that to dwell upon it were to waste time, and an hypothetical explanation of "opposite sexuality" would in no wise further our research.

The instincts, desires, tendencies, sentiments, etc., that relate to the conservation of the individual and to that of the species, have their material conditions clearly determined, the former in the totality of organic life, the latter in a special set of organs. But when from the primordial and fundamental forms of the affective life we pass to those which are of secondary formation and which have sprung up later in the course of evolution (tendencies social, moral, intellectual, æsthetic, etc.), then, to say nothing of the impossibility of assigning to these their direct organic bases, we find that they are by no means so general; none of them, except perhaps the moral and the social tendencies, express the individual in his totality; they are partial, and represent only one group in the sum total of his tendencies. Hence no one of them has of itself the power of producing a metamorphosis of the personality. As long as the habitude we call bodily sense (or cœnæsthesis) and that other habitude which is memory, do not come into play, there can be no complete transformation: the individual may be changed, he does not become *another*.

But these variations, though partial, are interesting. They show the transition from the normal to the morbid state. In studying the diseases of the will * we found in ordinary life many foreshadowings of the graver forms. Here, too, common observation shows us how little cohesion and unity the normal Me possesses. Apart from perfectly balanced characters (though in the strict sense of the term such characters do not exist) there are in every one of us tendencies of every kind, in every degree of contrariety, with all possible intermediate shades of difference, and with all sorts of combinations between them. For the Me is not merely a memory, an accumulation of recollections linked to the present moment, but a sum of instincts, tendencies, desires, which are simply its innate and acquired constitution entering into action. Memory is the Me *statical*, the group of tendencies is the Me *dynamical*. If, instead of being influenced unconsciously by the idea of the Me being an entity—a prejudgment instilled into us both by education and by the so-called testimony of consciousness—we were to take it for what it is, namely a coördination of tendencies and of psychic states whose proximate cause is to be sought in the coördination and consensus of the organism, we should no longer be surprised at its oscillations—incessant in fickle, but rare in stable characters—which for a longer or a shorter time, or even for an almost infinitesimal instant, exhibit the person in a new light. Some organic state, some external influence, reinforces some tendency; it becomes a center of attraction toward which converge the directly associated states and tendencies; then associations grow closer and closer; the center of gravity of the Me becomes displaced, and the personality is altered. "Two souls" said Goethe "dwell in my breast." Nor two only! If the moralists, poets, dramatists have shown us to satiety these two Mes contending in one Me, common experience shows yet more; it shows us many Mes, each as it comes to the forefront, excluding the others. This is less dramatic, but more true. "Our Me differs widely from itself at different times: according

* See the work so entitled (HUMBOLDT LIBRARY No. 52).

to a person's age, his various duties, the occurrences of his life, the excitements of the moment, such or such an aggregation of ideas which at a given moment represents the Me, becomes more highly developed than others, and takes the foremost place. We are another and yet the same. My Me as physician, my Me as man of science, my sensuous, my moral Me, etc., in other words, the complex of ideas, inclinations, will-tendencies, so denominated, may at any time come into a state of mutual opposition and repulsion. This would result not only in discord and scission between thought and will, but also in total loss of power, for each of these two isolated phases of the Me, if in all these spheres there was not a more or less open way for the return of the consciousness of some of these fundamental directions." * The orator, master of speech, who while speaking judges himself; the actor who notes his own performance; the psychologist who studies himself, all are instances of this normal scission of the Me.

Between these momentary and partial transformations (which because they are common do not strike one as psychologically important) and the more serious states we have yet to consider, there exist intermediate variations either more stable or more far-reaching, or both. The dipsomaniac, for example, leads two alternate lives: in one he is sober, discreet, industrious; in the other quite overmastered by passion, reckless, heedless. It is as though two incomplete and contrary individuals were grafted on a common trunk. The same is true of those who are subject to irresistible impulses and who declare that an external force constrains them to act in spite of themselves. We may cite also those transformations of character which are accompanied by cutaneous anæsthesia. One of the most curious instances of this was observed by Renaudin: A young man whose conduct had always been exemplary, suddenly gave way to evil tendencies. His mental state gave no clear evidence of alienation, but it was noticed that the whole surface of his body had become absolutely insensible. The cutaneous anæsthesia was intermittent. "When it ceased, the young man's disposition was quite different; he was now docile, affectionate, fully conscious of his painful situation: when it returned, immediately his evil inclinations controlled him, and these, as we found out, might go even so far as to incite him to homicide."

Inevitably we come back in every case to the organism. But this *excursus* through diverse fields of observation, however monotonous it may be, exhibits to us the variations of personality in all its aspects. Since no two cases are identical, each one offers a special decomposition of the Me. The cases last cited show us a transformation of character without lesion to the memory. As we proceed with our review of the facts, one conclusion will more and more impress itself upon our minds, viz., that *personality results from two fundamental factors—the bodily constitution with its tendencies and feelings, and the memory.*

If (as in the cases so far considered) only the first of these factors is modified, the result is a momentary dissociation followed by a partial change of the Me. If the modification is so profound that the organic bases of memory suffer a kind of paralysis, and become incapable of being revived, then the disintegration of the Me is complete: there is no longer a past, and there is a different present. Then a new Me is formed, and usually it knows nothing of the former Me. The cases of this kind are so well known that I will simply mention them, viz., the case of the American lady described by Macnish, that of Félida, described by Dr. Azam, and those recorded by Dufay.† Just because they involve the entire personality, these cases come under no specific heading, and we have no reason for mentioning them here rather than anywhere else, except that we wish to remark that the transition from one personality to another is always accompanied by a change of the character, associated no doubt with the unknown organic change which dominates the whole situation. This change is very clearly pointed out by Dr. Azam: his patient (Félida) is at one period gloomy, cold, reserved; in the other period, gay, sprightly, cheerful, full of life, even boisterous. The change is greater still in the following case, which I give in

* Griesinger, *Maladies Mentales*, p. 55. See a good essay by Paulhan on *Les Variations de la Personnalité à l'Etat Normal* (*Rev. Philos.*, June, 1887).

† For a full account of the observations, see Taine, *De l'Intelligence*, vol. I. p. 165; Azam, *Revue Scient.*, 20 May, 1876, 18 Sept., 1877, 10 Nov. 1879; Dufay, *ibidem*, 15 July, 1876. As regards the part played by memory in pathological cases, see *Diseases of Memory* (HUMBOLDT LIBRARY No 46), page 16 *et seq.*

some detail because it is recent and little known.*

The subject, a youth of seventeen years, V. L.—had an attack of hystero-epilepsy and quite lost all recollection of one year of his life. His character underwent a total change.

Born of "an unmarried vagabond girl and an unknown father, as soon as he was able to walk he began straying about the streets and begging. Later he became a thief, and was arrested and sent to the St. Urbain penal colony, where he worked as a farm-hand." One day while employed in the vineyard he grasped in his hand a snake concealed in a bundle of vine-cuttings. His fright was extreme, and on his return to the colony in the evening he lost consciousness. This fit returned again and again; his legs grew weak; at last came paralysis of his lower limbs, his intelligence remaining intact. He was now transferred to the Bonneval Asylum. There the physician reported of him that he had "a kindly, sympathetic expression"; that he was "of a mild disposition, and grateful for the care bestowed upon him. He would tell the story of his life with fullest details, even his thefts, of which he was ashamed. He laid the blame to his homelessness and to the influence of his companions, who led him into evil. He regretted the past, and declared that in the future he would lead a better life." It was decided to fit him for some occupation compatible with his infirmity. He learned to read, also to write a little. He was taken every morning to the tailor's shop, and being placed upon a table, assumed quite naturally the tailor's posture, his legs being paralyzed and greatly atrophied and contracted. At the end of two months he could sew very well, and was a diligent worker."

He had now an attack of hystero-epilepsy which continued for fifty hours, being succeeded by a quiet sleep. Then his former personality came back.

"On awaking, V— wanted to get up. He asked for his clothes, and succeeded in putting them on, though awkwardly; then he took a few steps about the room. The paraplegia had disappeared. His gait was unsteady and his legs could not sustain the weight of his body, but that was due to the atrophied state of the muscles. When his clothes were on, he wanted to go out to work on the farm with his comrades. We saw at once that the lad thought he was still at St. Urbain's, and that he wanted to resume his habitual occupations. He had in fact no recollection of his attack: did not recognize any one here—neither the doctor and nurses, nor his fellow-patients. He refused to believe that he had been paralyzed, saying that we were making sport of him. We attributed this to a momentary vesania, not an unusual sequel of strong hysteric seizures. But time went on, and still memory did not return. V— remembered distinctly his having been sent to St. Urbain's, that 'the other day' he was frightened by a snake, but from that point forward all was blank. He remembered nothing: he had no consciousness even of the lapse of time.

"Naturally we suspected that he was feigning, as hysterical subjects are wont to do, and we tried in every way to make him contradict himself, but in vain. Thus, we had him taken to the tailor's shop without letting him know where he was going. We walked alongside of him, careful not to give him a hint as to what direction he should take. V— did not know where he was going. Arrived at the shop, he gave no sign of knowing where he was, and declared he came there now the first time. A needle was put in his hand and he was asked to use it in sewing, but he set about it as clumsily as any one does who attempts for the first time to perform the task. Garments were shown him on which he had done the coarser stitching while in the paralytic state. In vain: he recalled nothing of all this. After a month of experiments, observations, and tests of every kind, we were convinced that V— remembered nothing."

One of the most interesting points of this case is the modification of the patient's character—a reversion to his prior life and hereditary antecedents.

"He is no more the same person: he is now quarrelsome, and an inordinate eater. He makes rude answers. He cared not for wine and usually gave his share of wine to his comrades: now he steals theirs. When some one tells him that once he used to steal, but that he ought not to begin thieving again, he boldly says that 'if he was a thief, he has paid for it, for they have put him in prison.' He is employed in the garden. One day he ran away, taking with him some property and sixty francs belonging to one of the infirmarians. He was captured five leagues away from Bonneval, just after he had sold his clothes to purchase others and was making ready to take the train for Paris. The arrest was not easily made, for he struck and bit the keepers who had come in pursuit of him. Brought back to the asylum, he became furious, shouting, and rolling upon the ground, so that he had to be confined in a cell."

Although we have not yet studied the

* The case is reported by Dr. Camuset in the *Annales Médico-psychologiques*, Jan., 1882.

anomalies of personality in all its forms, it will not be out of place here to attempt a few partial and provisional conclusions which will serve to lessen the obscurity of the subject. I will confine myself however to one point—to cases of false personality consisting essentially of a fixed idea, an overweening idea toward which converges the whole group of concordant ideas, all others being eliminated and as it were annihilated: as when persons believe themselves to be God, pope, emperor, and speak and act accordingly. The study of the intellectual conditions of personality will furnish us with many an instance of this—hypnotized subjects, for example, who assume a personality or enact a *rôle* at the operator's will; but the instances we are already familiar with warrant a question as to what we are to learn from them.

At first view, these cases are quite simple as regards the mechanism of their formation. The prime origin is obscure; why is this particular idea produced and not some other? Commonly we know nothing whatever about it, but once the morbid conception produced, it grows and grows, till at last it reaches its highest point, through the mere automatism of association of ideas. Hence it is not my intention to dwell upon this point, but to show that these pathological cases explain for us an illusion into which psychology has almost always fallen when it has based itself simply upon internal observation—the illusion of substituting for the real Me a factitious Me that is far simpler.

In order to comprehend the real, concrete personality and not an abstraction substituted in its room, what we must do is, not to shut ourselves up in our consciousness and, closing our eyes, proceed to question it: rather must we open our eyes and observe. The child, the peasant, the laborer, the millions of people who walk the streets or who work in the fields; who have never heard of Fichte or Maine de Biran; who have never read a dissertation on the Me and the non-Me, nor a single line on psychology—have each one his own definite personality, and this personality they instinctively affirm. Every moment ever since that forgotten epoch when their Me was first constituted, *i.e.*, when it was formed as a coherent group amid the occurrences that assail it, that group has maintained itself steadily, steadily undergoing modification. In great part it is made up of states and acts nearly automatic which in each individual constitute the bodily sense (or cœnæsthesis) and the routine of life; which serve as support to all the rest, but whose every alteration, how brief or partial soever, is immediately felt. In great part too it is made up of a complex of sensations, images, ideas, representing the habitual environment within which the individual lives and moves, with the recollections thereto attached. All this represents organized states, firmly linked together, mutually calling each other forth, systemized. The fact we actually are cognizant of, though we may not inquire into the cause. Whatever is new, unwonted; all changes in the state of the body or of its environment, are unhesitatingly adopted, classed by an instinctive act as forming part of the personality or as being external to it. Not by a definite and explicit judgment is this operation performed each moment, but by an unconscious logic far more profound than the logic of the schools. Had we to characterize with one word this natural, spontaneous, real, form of personality I should call it an *habitude*: nor can it be anything else, since, as we maintain, it is but the expression of an organism. Let the reader, instead of observing himself, proceed objectively: that is, let him observe and interpret with the aid of the data of consciousness the state of those who have never reflected upon their personality, and he will see that the foregoing thesis is true, and that real personality affirms itself not by reflection but by acts.

Let us now consider factitious or artificial personality. When the psychologist essays to comprehend himself, as he says, by inward observation, he attempts the impossible. When he sets about the task, either he restricts himself to the present, and that helps him little: or, letting his reflection extend over the past, he affirms himself to be the same that he was a year or ten years ago; he does but express learnedly and laboredly what any peasant knows as well as himself. By inner observation he can grasp only transitory phenomena, and so far as I know answer has never been made to these just observations of Hume:

"As for me, whenever I contemplate what is inmost in what I call my own self, I always come in contact with such or such special perception as of cold, heat, light or shadow, love or hate, pleasure or pain. I never come unawares upon my mind existing in a state void of perceptions: I never observe aught

save perception. . . . If any one, after serious reflection and without prejudices, thinks he has any other idea of himself, I confess that I can reason no longer with him. The best I can say for him is that perhaps he is right no less than I, and that on this point our natures are essentially different. It is possible that he may perceive something simple and permanent which he calls himself, but as for me I am quite sure I possess no such principle." Hume, Works, vol. 1, p. 321.

Since Hume's day some one has said: "Through the sense of effort and of resistance we feel that we cause" [*par l'effort et la résistance, nous nous sentons cause*]. True; and pretty nearly all schools agree that in this way the Me distinguishes itself from the non-Me: but the sense of effort nevertheless is still simply a state of consciousness—the sense of the muscular energy spent to produce a given act.

To seek to grasp by analysis a synthetic whole as personality is, or by an intuition of consciousness lasting at most a few seconds to seize a complex like the Me, were to attempt the solution of a problem whose data are mutually contradictory. The psychologists have gone to work differently. They have considered states of consciousness as accessories, and the tie that connects them as the essential thing: and it is this mysterious *underlying something* that, under the name of unity, identity, or continuity, becomes the true Me. Nevertheless plainly we have here only an abstraction, or more precisely a *schema*. For the real personality has been substituted *the idea of personality*—a very different thing. This idea of personality is like all general terms formed in the same way, as sensibility, will, etc.; but it is no more like the real personality than the plan of a city is like the city itself. And as in the cases of aberration of personality that have led to the present remarks, one idea has taken the place of a complex, forming an imaginary and a diminished personality, so by the psychologist the *schema* of personality is substituted for the concrete personality, and it is upon this beggarly framework that he rests all his reasoning, inductions, deductions and dogmatizings. Of course this comparison is made on the condition of *mutatis mutandis* and with many restrictions, which the reader will find out for himself.

In short, for one to reflect on his Me is to take an artificial position which changes its nature—to substitute an abstract representation for a reality. The true Me is that which feels, thinks, acts, without exhibiting itself, so to speak, to itself upon a stage. For the Me is in its nature and by its definition a subject: and to become an object it must undergo a reduction, an adaptation to the mind's optical conditions, and that transforms it, mutilates it.

Till now we have considered the question only on its negative side. To what positive hypothesis as to the nature of personality are we led by the observation of morbid cases? First let us lay aside the hypothesis of a transcendental entity —an hypothesis that cannot be reconciled with pathology, and which explains nothing.

Let us put aside also the hypothesis which makes of the Me "a bundle of sensations" or of states of consciousness, as many have held it to be, following Hume. So to think is to take appearances for reality, a group of signs for a thing, or more exactly, to take effects for their cause. Besides, if, as we hold, consciousness is only an indicative phenomenon, it cannot be a constitutive state.

We have to penetrate deeper, to that *consensus* of the organism of which the conscious Me is but the psychological expression. Has this hypothesis any firmer ground than the other two? Both objectively and subjectively considered, the characteristic trait of personality is that continuity in time, that permanence which is called identity. This has been denied of the organism, on grounds so well known that there is no need to state them: but it is strange that those who refuse to concede continuity, identity, to the organism should fail to see that all the arguments for a transcendental principle hold good also for the organism, and that all the arguments that can be brought against the latter have the same force against the former. That every higher organism is *one* in its complexity is an observation at least as old as the Hippocratic writings, and since Bichat's time no one attributes this unity to a mysterious vital principle; certain writers however make a great noise about the constant molecular renovation which constitutes life, and ask, Where is the identity? But as a fact every one believes in this identity of the organism. Identity is not immobility. If, as some savants hold, life has its seat not so much in the chemical substance of the protoplasm, as in the motions of the particles, then it is a "combination of motions," or a "form of motion," and this constant

molecular renovation must itself be subordinate to more recondite conditions. However that may be, every unbiased mind will admit that the organism possesses identity. What hypothesis then could be more simple or more natural than to consider the conscious identity as the inward manifestation of the external identity subsisting in the organism?

On this physical basis of the organism rests also, according to our thesis, what we call the unity of the Me, *i.e.*, the interdependence which links together the states of consciousness. The unity of the Me is the unity of a complexus, and only by a metaphysical illusion do we accord to it the ideal unity of the mathematical point. It consists not in the act of a supposedly simple "essence," but in a coördination of the nerve centers, which themselves represent a coördination of the functions of the organism. It is true that here we have to do with hypotheses, but at least they have no supernatural character.

Take man in the fœtal state, before the beginning of psychic life: leave out all the hereditary dispositions already in any way impressed upon him, which will later come into play. At some undefined period, at the latest in the last weeks of the fœtal life, some sort of body sense (cœnæsthesis) must come into existence—a vague feeling of well-being or of discomfort. However confused this may be supposed to be, it implies certain modifications in the nerve centers, as far as their rudimentary state may allow. When, later, sensations (objective or not) of external causation are added to these simple vital, organic, sensations, they too necessarily produce a modification in the nerve centers. But they are not inscribed on a *tabula rasa*; the warp of the psychic life is already laid, and this warp is general sensibility, the feeling of life, which, even though it be very vague, absolutely constitues, at this period of life, almost the total sum of consciousness. Thus we have a glimpse of the origin of the connection between states of consciousness. The first sensation—supposing one to exist in the isolated state—does not come like an aërolite in a desert: at its entrance even it is connected with others—with the states which constitute the bodily sense, and which are simply the psychic expression of the organism. In terms of physiology, this means that the modifications of the nervous system representing materially sensations and the desires that arise out of them (these being the first elements of the higher psychic life) are added to prior modifications which are the material representatives of the vital and organic sensations; and that thereby relations are established between these nervous elements; so that from the first the complex unity of the Me has its conditions of existence, and these it finds in that general consciousness of the organism so much overlooked, though it is nevertheless the main support of all the rest. In short, all depends upon the unity of the organism: and when the psychic life, having itself passed the embryonic stage, has taken shape, the mind may be compared to a rich piece of tapestry where the warp has completely disappeared, being in some instances lightly overlaid with figures, in others being embroidered in high relief; the psychologist who employs inner observation only, sees but the figures and the embroidered designs, and loses himself in a maze of conjecture as to what may underlie them; if he were but to change his position or to look at the reverse side, he would save himself many a useless induction, and would learn more.

The same thesis might be discussed under the form of a criticism of Hume. The Me is not, as Hume held, a mere bundle of perceptions. Without appealing to psychology, but confining one's self to simple ideological analysis, one observes here the omission of one important point, viz., the *relations* between the primordial states. Relation is an element vague in its nature, and hard to determine, since it does not exist by itself. Still, it is something more and something else than the two states which limit it. In Herbert Spencer's *Principles of Psychology* is found a searching study (too little noticed) of the elements of psychic life, with hypotheses as to their material conditions. Quite recently Mr. W. James has taken the question up again.* He compares the course of our consciousness with its uneven flow to the progress of a bird that alternately flies and perches. The resting-places are occupied by relatively stable sensations and images: the spaces passed over in flight are represented by thoughts of relations between the points of rest: the latter—the "transitive portions" are nearly always forgotten. It seems to me

* See *Mind*, Jan., 1884, p. 1 *et seq.*

that this is our thesis in another form—the continuity of the psychic phenomena by reason of a deep, hidden *substratum*, to be sought in the organism. In truth, that were a precarious sort of personality which should have no other ground, but consciousness, and this hypothesis is found wanting when tested by the simplest facts: as for instance when an explanation is asked of the fact that after a sound sleep of six or eight hours I unhesitatingly declare my identity. To refer the essence of our personality to a mode of existence (consciousness) that disappears at least during one-third of our life, is to offer a curious solution.

We therefore maintain, as we have elsewhere done with regard to memory, that individuality, in itself and such as it exists actually in the nature of things, is not to be confounded with individuality as it exists for itself in virtue of consciousness (personality). The organic memory is the basis of all the highest forms of memory, these being only its more perfect phases. The organic individuality is the basis of all the highest forms of personality, which are only its development. Of personality, as of memory, I hold that it is completed, perfected, by consciousness, not constituted by consciousness.

Although, in order to keep these remarks within due limits, I have carefully abstained from all digression, from criticism of opposite doctrines, and from exposition of points of detail, I must, in passing, point out one question which suggests itself naturally: Does the consciousness of our personal identity rest upon memory, or *vice versâ?* One person will say, without memory I should be but a present existence incessantly renewed, and that does away with all possibility, however faint, of identity. Another will say, without a feeling of identity binding them together and impressing a character upon them, my recollections would not be mine: they would be foreign to me. Is it then memory which produces the sense of identity, or is it the sense of identity which produces memory? Neither! These are both *effects*, whose cause is to be sought in the organism: for on the one hand its (the organism's) objective identity is expressed in that subjective state which we call the sense of personal identity; and on the other hand, it is here (*i.e.* in the organism) that are enregistered the organic conditions of our recollections, and here too is found the basis of our conscious memory. The feeling of personal identity, as well as memory in the psychological sense, are effects whereof the one cannot be the cause of the other. Their common origin is in the organism, where identity and organic enregistration (*i.e.* memory) are one. Here we touch one of those mal-posited-questions which abound in the hypothesis of an entity-consciousness.

CHAPTER IV.

INTELLECTIVE DISTURBANCE.

In certain morbid states the traditional five senses are subject to serious perturbations, their functions becoming perverted or distorted. Do these "paræsthesias" and "dysæthesias" play any part in changes of personality? Before we examine this point, we have first to ask, what happens when one or more of the senses are suppressed? Is the personality then altered, maimed, or transformed? Experience seems to give answer in the negative.

Total loss of any sense may be either acquired or congenital. We will first consider the former case. We will set aside the two secondary senses, taste and smell, as well as touch in its several forms, allied as it is to the general sensibility; and we will consider only hearing and sight. Instances of acquired blindness and deafness are not rare: quite frequently they produce modifications of character, but such changes are not radical, and the individual remains the same. Congenital blindness and congenital deaf-muteness affect the personality more profoundly. Those who are deaf-mutes from birth, if they have to depend on their own resources and are not instructed in the deaf-mute language, remain in a state of mental inferiority. This has sometimes been exaggerated,* but it is nevertheless incontestable, and it is due to causes so often explained that there is no need to recall them here. The conscious personality falls below the normal stage: but in this case we have an arrest of development rather than an alteration of personality in the strict sense of the term.

As for those born blind, many of them, as we know, are clever and ingenious, and there is no ground for supposing in their case any diminution or alteration of

* See on this point the facts reported by Kussmaul, *Die Störungen der Sprache*, VII. p. 16 *et seq.*

personality. However odd, to our minds, their conception of the visible world, which they image to themselves according to hearsay only, that does not seriously affect either the nature of their personality or the idea they have of it.

Take the case of Laura Bridgman—the most noted case of sense privation on record, a case minutely studied, and fully detailed.* Here we see a woman bereft at the age of two years of sight and hearing, almost entirely deprived of the senses of smell and taste, and possessing only the sense of touch. Doubtless very great credit is due to the painstaking and intelligent training which has fashioned her mind: nevertheless her instructors could not endow her with new senses, and her one sense of touch had to suffice for all purposes. Now Laura Bridgman is seen to possess an individuality of her own, and a clearly marked character, being of a kindly disposition, almost invariably good-humored, untiring in her efforts toward self-instruction: in short, she is a *person*.

Disregarding the innumerable details involved in the foregoing cases, we may safely conclude that congenital or acquired privation of one or more of the senses involves no morbid state of the personality. In the less favorable cases there is a relative arrest of development, which is remedied by education.

For those who hold the Me to be an exceedingly complex composite—and such do we hold it to be—every change, addition, or subtraction, in its constituent elements affects it more or less. But the aim of our analysis is precisely to distinguish, in these elements, what is essential from what is accessory. What the external senses (touch excepted) bring in is not an essential factor. The senses determine and circumscribe the personality; they do not constitute it. Were it not rash to trust to pure logic in questions of observation and experience, this conclusion might be deduced *a priori*. Sight and hearing are pre-eminently objective: they reveal to us what is without, not what is within. As for touch, a complex sense which many physiologists resolve into three or four senses, this, in so far as it makes us acquainted with the properties of the outer world—in so far as it is an eye for the blind—belongs in one group with sight and hearing; otherwise, it is only one form of the sense we have of our own body.

It may seem strange to say that paræsthesia and dysæsthesia, of which we are now to treat, *i. e.*, simple sensorial perturbations or alterations, disorganize the Me. Yet observation proves this, and reflection explains it. This work of destruction comes not from them alone; they are but an external episode of an internal disorder that lies deeper, and which affects the bodily sense (or cœnæsthesis). These sensorial disturbances are causes assistant rather than efficient. This the facts will show.

Alterations of personality with sensorial disturbances, but without noteworthy hallucinations, without loss of judgment, are found in certain morbid states. We select as a type the neurosis studied by Krishaber under the title "cerebro-cardiac neuropathy." It matters little whether or no this group of symptoms deserves to be regarded as a distinct pathological unit: that is a question for physicians. † Our investigation is not concerned with it.

First let us consider briefly the physiological disturbances whose immediate effect is to produce a change in the cœnæsthesis, or bodily sense. First, there are disorders of the circulation, consisting principally in an extreme irritability of the vascular system, due probably to excitation of the central nervous system, whence results contraction of the small vessels, ischæmia in certain regions, insufficient nutrition, and exhaustion. Then there is disordered locomotion, dizziness, a constant feeling of vertigo, unsteady gait as from intoxication, hesitating step, involuntary impulse to walk "as though moved by a spring."

Passing from interior to exterior, we find the sense of touch, which forms the transition from general sensibility to the special senses. Some subjects have a feeling as if they no longer weighed anything, or of being very light. Many lose all precise notion of resistance, and cannot by touch alone determine the shapes of objects. They believe themselves to be "apart from the universe": their body, as it were, surrounded by insulating media interposed between it and the outer world.

"There was formed," says one who was so affected, "a sort of murky atmosphere round

* See Mary Swift Lamson, *Life and Education of Laura Dewey Bridgman, the Deaf, Dumb, and Blind Girl.*

† Krishaber, *De la Neuropathie Cérébro-Cardiaque.* Paris, Masson, 1873.

about my person; nevertheless, I saw perfectly well that it was a clear day. The word 'murky' does not express my thought exactly: in German I should call it 'dumpf,' which means heavy, thick, dull. This sensation was not only visual, but cutaneous. The 'thick' atmosphere enveloped me; I saw it, felt it; it was as if I were surrounded by a bad conductor of some kind which insulated me from the outer world. I cannot tell you how impressive this sensation was: I felt as though I had been carried away to an immense distance from the world, and involuntarily I cried out aloud, 'I am far away, far away.' Still, I knew very well that I was not far away, and I remembered distinctly all that had happened to me: but between the moment before and the moment after my attack, stood an interval of immeasurable duration, a distance like that from earth to sun."

The sense of sight is always affected. To say nothing of slight disorders of vision (photophobia, amblyopia), some patients see all objects double: to others, all surfaces seem flat, and to them a man looks like a reliefless silhouette. For many patients, surrounding objects appear to shrink in size, and to retreat into immeasurable distance.

The troubles of the sense of hearing are of a similar nature. The patient does not recognize the sound of his own voice: it seems to come from far away, or to be lost in space, so that it never can reach the ears of those he is talking with; and their replies are no less difficult to hear.

If we bring together in thought all these symptoms (which are accompanied by physical pain, and by changes in the sense of taste and of smell) we find ourselves in presence of a group of internal and external sensations of a new character, united by their simultaneity in time, but more deeply united by the morbid state which is their common source. Here we see all the elements of a new Me: sometimes a new Me is formed. "I have lost consciousness of my being: I am no more myself"—such is the language of patients as reported by most observers. Some patients go farther and at times fancy themselves to be double; "A curious thought possesses my mind in spite of myself" said one patient, a civil engineer; "I believe myself to be double. I feel within me a Me that thinks and a Me that acts." (Krishaber, Obs. 6.)

This process of formation has been so well studied by Mr. Taine, that I need not do the work over again.

"One might best compare the state of the patient to the state of a caterpillar which, retaining all its ideas and all its recollections of the caterpillar state, should in an instant become a butterfly, with the senses and sensations of a butterfly. Between the old state and the new, between the first Me (that of the caterpillar) and the second Me (that of the butterfly) there is a deep cleft, a complete rupture. The new sensations find no anterior series with which to connect, the patient cannot interpret them, cannot use them: he does not recognize them, for him they are as unknown. Hence two strange conclusions, first, 'I am not'; the second, a little later, 'I am another.'" *

It is difficult for a sane, well-balanced mind to conceive of so extraordinary a mental state as this. The skeptical observer who looks at the matter from without, does not accept these conclusions, but the patient, who looks at it from within, finds them rigorously correct. For him this continual feeling of vertigo and intoxication is like a permanent chaos, in which the state of normal equilibrium and coördination either cannot exist or at least cannot endure.

If now we compare with the other more or less serious forms this change of the personality *a sensibus læsis*, we find that a new Me is not in all cases formed: when it is formed, it always disappears with the sensorial disturbances. It never supplants entirely the normal Me; there is an alternation between the two; the elements of the original Me retain so much cohesion that it resumes at intervals the supremacy. Hence the illusion—but which is not in the strict sense an illusion for the patient—that he is double.

As for the psychological mechanism by which he thinks himself double, that is explained by the memory. I have before endeavored to show that real personality, with its enormous mass of sub-conscious and conscious states, presents itself to our mind in an image or fundamental tendency which we call the *idea* of our personality. This vague conception (*schema*), which represents the real personality much as the general idea of "man" represents a man, or as the plan of a city represents that city, suffices for the ordinary needs of our mental life. In neuropathic patients there must be two images or *schemas* which succeed each other in the consciousness, as the physiological state gives precedence to the new Me or the old. But in the transition

* *Revue Philosophique*, vol. I., p. 289. See also *L'Intelligence*, 4th ed., vol. II., appendix.

from the one to the other, however sudden it may appear, there is a certain continuity. There is no absolute beginning of the one state of consciousness with absolute ending of the other, but with an hiatus, vacancy between. Like all states of consciousness, these have a certain duration: they occupy some portion of time, and the terminal end of one touches the initial end of the other. Nay they trench upon each other; while one is beginning the other still subsists, though vanishing: for a certain period they coexist. In our opinion it is *during this period of co-existence or of transition*, that the patient thinks himself twain.

Finally it is to be observed that the sensorial disorders are only the result of a deeper disorder that is felt throughout the organism; and that consequently here again the bodily sense plays the principal part in the pathology of personality.

We can now understand how the congenital or acquired suppression of one or more of the senses leaves the personality intact at bottom, while momentary perversions of a less serious aspect transform it. Physiologically considered, we have in the first case a sum of nervous elements condemned to inertia either at their origin or in the course of the individual's life: here the personality is like a weak or a weakened orchestra, which however serves for all necessary purposes. In the second case all the nervous elements subsidiary to the impaired external senses, to muscular sensibility, and to organic and visceral sensibility, have undergone an unwonted modification: it is as with an orchestra in which most of the instruments have changed tone.

A natural transition from sense perceptions to ideas is seen in hallucinations, and we have now to consider the part played by these in anomalies of personality. Let us at the outset recall some general considerations touching the hallucinatory state.* Four hypotheses have been offered to explain it.

1. The peripheric or sensorial theory, which finds the seat of hallucinations in the sense-organs.

2. The psychic theory, which localizes it in the center of ideation.

3. The mixed, or psycho-sensorial theory.

4. The theory which refers hallucination to the perceptive centers of the cortical layer.

Observation teaches us that hallucinations affect now one sense only, again several senses; that usually they extend to both sides of the body, less often to only one side—right or left indifferently; more rarely still they are bilateral but at the same time present a different character at each side: thus one ear may be assailed by threats, abuse, evil counsels, while the other may hear only words of comfort; or one eye may see only things depressing and repugnant, while the other may see gardens full of flowers. The latter cases, those at once bilateral and contradictory, are most interesting for us.

Fortunately we have to explore only a very restricted area of this immense domain. Let us clearly define our subject. In the normal state the individual that senses and thinks is adapted to his environment. Between the group of internal states and relations that constitute the mind, and the group of external states and relations that constitute the outer world, there exists a correspondence, as Herbert Spencer has shown in detail. In the hallucinate this correspondence is destroyed: hence false judgments and senseless acts, that is non-adapted acts. Nevertheless all this constitutes a disease of the reason, not of the personality. No doubt the Me suffers an impairment, but as long as the *consensus* which constitutes it has not disappeared, and has not split in two, or has not alienated a part of itself (as we shall see later) there is no proper disease of personality and the disorders are secondary and superficial. Consequently we may leave out of consideration the immense majority of cases of hallucination.

Neither need we take account of the large number of patients who misapprehend others' personalities—who take the physicians and the nurses in the asylum for their own relatives, or who take their own relatives for the imaginary personages of their ravings. †

The ground being thus cleared, the cases that remain to be studied are not

* For a full exposition of the question see Binet's important articles in the *Revue Philosophique*, April and May, 1884.

† For some patients the same individual is alternately transformed into an imaginary personage and kept in his real personality. A woman patient would now recognize her husband, again would take him for an intruder. She had him arrested by the police, and he had much trouble in proving his identity.

very numerous, comprising only changes of personality with their basis in hallucination. Nearly always there is simply an *alienation* (in the etymological sense) of certain states of consciousness which the Me does not consider as its own, which it makes objective, which it sets outside itself, and to which it at last attributes an actual existence independent of its own.

As regards hearing, the history of religious insanity furnishes many instances: I will cite the simpler cases, those in which the hallucinatory state stands alone at first. A woman was beset by an inner voice "which she heard only in her ear," and which made opposition to whatever she herself willed. The voice was ever for evil, while the patient willed the good. It would at times cry out to her though it could not be heard externally "Take your knife and kill yourself." Another woman, subject to hysteria, at first uttered words that she did not intend to utter, and soon she began to express these alien thoughts in a voice different from her ordinary voice. At first this voice made remarks of an ordinary tenor or not inconsistent with reason: afterward it assumed a habit of negation.

"To-day, after thirteen years, the voice simply confirms what the patient has just said, or comments upon her words, criticises them, ridicules them. The tone of this voice, when the 'spirit' speaks, always differs a little and sometimes differs totally from the patient's ordinary voice, and hence it is that she believes in the reality of the spirit. I have myself often observed these facts." *

As regards sight, aberrations of this kind are less frequent. "A very intelligent man" says Wigan (page 126), "had the faculty of bringing before himself his own double. He would laugh heartily when the double appeared, and the double would laugh too. This was for a long time a matter of amusement for him but the final result was pitiable. The man gradually came to believe that he was haunted by himself. To put an end to this wretched life he arranged his affairs, and unwilling to enter on another year, at midnight of Dec. 31 he shot himself with a pistol in the mouth."

Finally, Dr. Ball † describes the case of a young man who, while traveling in South America had a sunstroke which "left him very ill: he was unconscious for a month. A few days after having regained his senses, he heard distinctly a man's voice perfectly articulated, uttering the words, 'How are you to-day?' The patient answered and a short conversation ensued. The next day the same question was repeated. This time the patient looked about, and could see no one in the room. 'Who are you?' he said, 'I am Mr. Gabbage,' answered the voice. Some days later the patient had a glimpse of his interlocutor, who thenceforward presented the same features and dress. He saw him always from the front, but only his bust; he always wore a hunting costume, and had the look of a vigorous and well built man of about thirty-six years, with a heavy beard; complexion dark, eyes large and black, and eyebrows strongly marked. Impelled by a justifiable curiosity, our patient would fain know the calling of his questioner and how and where he lived, but the man never consented to tell more about himself than his name."

At last Gabbage grew more and more exacting, ordering the young man to throw into the fire his newspaper, his watch and chain, to poison a young woman and her child, to throw himself out of a third-story window, etc.

In these facts we see the beginning of a *dissolution of personality*. We will further on cite other cases not having their ground in hallucination, and which will enable us better to understand these. That coördination more or less perfect which in the normal state constitutes the Me, is here partially broken up. In the group of states of consciousness which we feel to be our own because they are produced or experienced by ourselves, there is in such cases one which, though it has its source in the organism, does not enter into this *consensus*, stands apart, appears as though foreign to it. Here we have in the order of thought the analogon of irresistible impulse in the order of action—a partial incoördination. ‡

Certainly these voices and these visions emanate from the patient: why then does he not regard them as his own? It is a difficult question but I will endeavor to answer it. There must exist anatomical and physiological causes which would solve the problem, but unfortunately they are hidden from us.

* Griesinger, *Mental Diseases*, French trans. p. 285. Baillarger reports a similar case in the *Annales Médico-Psych.*, 1st. series, vol. VI. p. 151.

† *Cerebral Dualism*. See HUMBOLDT LIBRARY No. 87. p. 31.

‡ With regard to irresistible impulse as a phenomenon of partial incoördination, see *Diseases of the Will*, *Chapter* III. (HUMBOLDT LIBRARY No. 52.)

Being ignorant of the causes, we can view only the surface, the symptoms, the states of consciousness, with the signs which interpret them. Take then a state of consciousness (with its organic conditions) having this special character of being local, *i. e.*, one that has the faintest possible relation to the physical and psychic organization. To make my meaning clear by antithesis, take a violent, sudden emotion: it reverberates everywhere, stirs the whole life, physical and mental: there is thorough diffusion. Our case is the reverse of this. Organically and psychically, it has but few connections, and these precarious, with the rest of the individual. It is outside, like a foreign body lodged in the organism, and not sharing in its life. It does not enter the general sensibility (cœnæsthesis) which maintains and unifies the whole. It is a cerebral phenomenon almost without a support, like the thoughts imposed by suggestion in hypnotism. What gives force to this attempt at an explanation is the fact that the morbid state, unless it be removed by nature or by medical treatment, has an irresistible tendency to expand and grow strong at the expense of the original personality, which begins to decline, preyed upon by this parasite. Nevertheless, in this case it retains its original character: it does not constitute a duplication of personality but an alienation.

I offer this effort toward an explanation only as an hypothesis, well aware that our ignorance of the organic conditions of the phenomenon makes definitive proof impossible. In presenting this explanation I have had to anticipate what will later be said with regard to ideas, and which will perhaps furnish us with new arguments in favor of our hypothesis.

We come now to speak of recent experiments on hallucinations; these, in conjunction with other facts, have led certain authors to offer an explanation of double personality so simple as to be palpable, so to speak. These authors show first the functional independence of the two hemispheres of the brain, and thence infer that from their synergy results equilibrium of the mind, but from their disaccord sundry perturbations and finally scission of the psychic individual. There are here two distinct questions that are clearly recognized by many of the authors we are about to quote, but which have been confounded by others.

A physician of note as a psychologist, Sir Henry Holland, was the first to study in 1840, the brain as a double organ, and to suggest that certain mental aberrations might be due to ill-regulated action of the two hemispheres, seeing that, in some cases, the one seems to correct the perceptions and the feelings of the other. In 1844 Wigan went farther, holding that we have two brains, not one brain, and that "the corpus callosum, instead of being a bond of union between them, is a wall of separation."* Later progress in brain anatomy yielded more positive results, showing the inequality in weight of the two lobes of the brain, their constant asymmetry, differences in the topography of the cortex, etc. Broca's discovery of the seat of aphasia was a new argument of great value. It was further supposed that the left hemisphere might be the principal seat of intelligence and will, while on the right hemisphere would devolve more especially the life of nutrition (Brown-Séquard). I condense this account, which else might be long, to come at once to hallucinations. The occurrence simultaneously of contradictory hallucinations—joyous and sad—attracted the attention of observers. There was something better than observation, too—experimentation; and hypnotism made this possible. The hypnotized subject has three phases: the lethargic, characterized by nervo-muscular excitability; the cataleptic, produced by raising the eyelids of the subject; the somnambulic, caused by pressure on the vertex. If during the cataleptic state we lower the right eyelid, we thereby act upon the left brain, and determine a lethargic state of the right side only. Hence the subject finds himself as it were divided in twain: he is hemilethargic on the right side, hemicataleptic on the left. I take from Richer's well-known work an account of what takes place.

"I set upon a table a pail of water, a basin, and soap. As soon as the patient's eye is drawn to these objects, or her hand touches one of them, apparently quite of her own accord she pours water into the basin, takes the soap, and washes her hands with scrupulous

* Wigan, *The Duality of Mind Proved by the Structure, Functions, and Diseases of the Brain, and by the Phenomena of Mental Derangement, and shown to be Essential to Moral Responsibility.* London, 1844. This ill-compacted work does not bear out the promise of its title.

care. If now we close the lid of one of her eyes, the right for instance, the whole right side becomes lethargic, and the right hand is stayed, while the left hand continues to perform its movements. Raise the eyelid again, and both hands resume their action as before." The same thing occurs with the left side. "Put in the patient's hands the box containing her knitting, and she will open it, take out her work, and knit away with remarkable skill. Close one of her eyes, and the corresponding hand stops, the arm falling inert to her side, while the other hand strives to continue, unaided, a work that now is impossible. The mechanism keeps on working on one side, but it modifies its motions in order to make them effective."

The author recounts several instances like this: I will cite only the last one, because it confirms Broca's experiment. One places in the subject's hands an open book directing her gaze upon one of the lines. She begins to read.

"During the reading, if you close the right eye—and by the decussation of the optic nerves, it is the left brain that is now affected—she stops short in the middle of a word or of a phrase. When the right eye is opened again, she forthwith completes the interrupted word or phrase. If on the other hand the left eye be closed, she continues her reading, hesitating a little because she is amblyopic and achromatopsic in the right eye." *

These experiments may be varied. A different attitude is given to the members of each side of the body: then the subject shows, on one side, the expression of one giving a command, on the other, that of one that is smiling and sending kisses. We can produce the hallucinatory state on the right side only, or on the left side only. Or let two persons approach the ear of the subject; one, on the right, speaks of the fine weather, and there is a smile on the right side of the subject's countenance: the other, on the left, tells how it rains, and the left side manifests dissatisfaction, while the labial commissure falls. Or again, while one is suggesting through the right ear the hallucination of a *fête champêtre*, let another at the opposite ear imitate the barking of a dog: then the right side of the face expresses pleasure, the left uneasiness.

These experiments (of which we give only the baldest summary), together with many other facts, lead inevitably to the conclusion that the two hemispheres are *relatively* independent; that this does not at all contradict their normal coördination; but that in certain pathological cases this relative independence may become an absolute dualism.

Some authors go farther, and hold that this cerebral dualism suffices to account for all disaccord in the mind, from mere hesitation in choosing between two things, to complete duplication of personality. If we simultaneously will the good and the bad; if we have criminal impulses and a conscience that condemns them; if the insane at times are conscious of their insanity; if the delirious have lucid moments; if finally some individuals believe themselves to be double, the reason is simply that the two hemispheres are in disaccord: the one is sane, the other morbid: one state prevails in the right brain, its opposite in the left—a sort of psychological manicheism.

Griesinger, on encountering this theory, for it was put forward timidly in his day, having cited the facts supposed to make in its favor, and having described the case of one of his patients who "was conscious that he was out of his mind on one side of his head, the right," concludes in these words: "As for me, I am not in the least disposed to accord any great weight to these facts." Have they gained in cogency since? It is very doubtful. In the first place, since the theory rests on the question of number, are there not individuals who believe themselves to be triple? I find at least one case. "I have met," says Esquiros, "in an institution for the insane a priest who, having applied his mind too intently to the mystery of the Holy Trinity, came at last to see around him triple objects. He fancied that he himself was in three persons, and wanted to be served at table with three covers, three plates, three napkins."† Other cases could, I suppose, be found, were one to search for them: but I do not care to take advantage of this case of triplicity, for it is susceptible of many interpretations. The theory in question is opposed by stronger reasons, based upon familiar facts. Its ultimate ground is the perfectly gratuitous hypothesis that the contest is always between *two* states only. This is flatly contradicted by experience. Who is there that has never found himself hesitating between doing this and doing that and refraining from acting at all? between making a journey northward or

* P. Richer, *Études Cliniques sur l' Hystéro-Épilepsie*, p. 391.

† *Revue des Deux Mondes*, 15 Oct., 1845, p. 307.

southward, or remaining at home? Many a time in our lives does it happen that we have to make our choice between three alternatives each one of which necessarily excludes the other two. Where shall we locate the third? for under that strange form the question has been raised.

In some cases of congenital atrophy of the brain which appear to be confirmed by authentic observations, we find individuals possessing from infancy only one cerebral hemisphere, yet their intellectual development has been up to the ordinary standard, and they have been like other human beings. * In such individuals, according to the hypothesis we are combating, there could have been no interior conflict. But it is needless to pursue this criticism further, and I content myself with recalling Griesinger's remark upon a verse in Faust. Not two souls only, but many souls dwell within us.

Idle indeed were this discussion if it did not afford us a view of our subject under a different aspect. These contradictions within the personality, this partial scission in the Me, such as we see them in the lucid moments of insanity and delirium, or in the self-condemnation of the dipsomaniac while he raises the cup to his lips, are not oppositions in space (of one hemisphere against the other) but oppositions *in time*. To borrow a favorite expression of Lewes's, they are successive "attitudes" of the Me. This hypothesis accounts for everything that is explained by the other and besides it explains what that does not.

If one is fully imbued with the idea that personality is a *consensus*, one will easily see how the mass of conscious, sub-conscious, and unconscious states which make it up may at a given moment be summed up in a tendency or a predominant state which, for the person himself and for others, is its expression at that moment. Straightway this same mass of constituent elements is summed up in an opposite state which has become predominant. Such is our dipsomaniac, who drinks and who condemns himself. The state of consciousness predominant at a given moment is for the individual himself and for others his personality.

Clearly three states or more may succeed one another (co-exist apparently) by the same mechanism. We are no longer restricted to the number two. True, it must be admitted that this inner scission occurs more frequently between two contrary states than between three or more. This is owing to certain conditions of consciousness which we must recall.

Is there actual co-existence of two states of consciousness, or only so rapid a succession of one to the other as to resemble simultaneousness? The question is a very difficult one and has not yet been settled, though it will perhaps one day be settled by the psycho-physicists. Hamilton and others have maintained that we may have as many as six impressions at once, but their conclusion is grounded on very inexact observations. The determination of the duration of states of consciousness by the rigorous processes of physics is a great step in advance. Wundt has endeavored to go further, and to determine by experiment what he justly calls the extension of consciousness (*Umfang des Bewusstseins*), that is, the maximum number of states that it can simultaneously contain. His experiments have had to do only with exceedingly simple impressions (the strokes of a pendulum at fixed intervals punctuated by strokes on a small bell) and therefore they are not in all respects applicable to the complex states we are considering. He finds that "twelve representations form the maximum 'extension' of consciousness in the case of successive relatively simple states." † Experience then, seems to pronounce in favor of a very rapid succession, equivalent to a co-existence. The two, three, or four contrary states would be at bottom a succession.

Further, we know that, to use a comparison that is often employed, consciousness, like the retina, has its "blind spot." Distinct vision is but a small portion of the total vision. Distinct consciousness is only a small portion of the total consciousness. Here we hit the natural, the incurable cause of that illusion whereby the individual identifies himself with his existing state of consciousness, particularly when the same is intense; and of necessity this illusion is far stronger for himself than for others. We see also why (apparent) co-existence is easier for two contrary states than for three; and far easier than for a larger number. This fact is due to the limitations of the consciousness. As we said

* Cotard, *Etude sur l'Atrophie Cérébrale*, Paris, 1868. *Dict. Encyc. des Sciences Médicales*, art. CERVEAU, pp. 298, 453.

† *Grundzüge der Physiol. Psychologie*, 2d ed., vol. II., p. 215.

before, there is an opposition in time, not in space.

In short, the relative independence of the two hemispheres is not open to doubt: neither may we doubt that the personality is perturbed by disaccord between them. But to reduce the whole matter to a simple division between the left side and the right is an hypothesis not supported by any weighty argument.

A few words with regard to memory. We have no occasion to study memory separately, for it pervades our subject everywhere. Personality, in fact, is not a phenomenon but an evolution; not a momentary thing but a history; not a present nor a past but both. We will not consider what I may call the objective, intellectual memory—the sense perceptions, images, experiences, cognitions stored up within us. All these may disappear, in part or wholly, through diseases of memory, of which we have given many illustrations elsewhere.* We will consider now only the subjective memory—memory of ourselves, of our physiological life and of the sensations or feelings that accompany it. This distinction is purely artificial, but it will enable us to simplify matters.

First, does such a memory exist? One might say that in the perfectly healthy individual the vital tone is so constant that the consciousness he has of his body is but a present ever repeated; but this monotony, if it exists, by excluding consciousness would on the other hand favor the formation of an organic memory. As a fact there are always going on changes—inconsiderable they may be—and as we are conscious only of differences, these are felt. So long as they are faint and partial the impression of uniformity persists, because actions that are continually repeated are represented in the nervous system far more enduringly than ephemeral changes. Consequently the memory of them is organized beneath consciousness, and it is hence all the more firmly based. Here we see the groundwork of our identity. These slight changes act in the long run, producing what is called an insensible change. After ten years of absence, an object, say a monument, is the same to the eye, but it is not the same as regards feeling and sentiment: here it is not the faculty of sense perception but its accompaniment that has changed. But we have here the state of sanity and health—the simple transformation that is natural to everything that lives and that evolves.

Such is organic memory, such its habit. But now let certain disturbing causes intervene of which we can demonstrate the effects, subjective and objective. There is produced a profound and sudden, or at least a rapid and persistent transformation of the cœnæsthesis. What is the result? Experience alone can tell, for in our ignorance of the causes we are reduced to simple empiricism. In extreme cases—and we will not notice others—the individual is changed. His metamorphosis occurs in three principal forms, as regards the memory,

1st. The new personality, after a longer or shorter period of transition, alone remains, the original personality being forgotten (Leuret's patient). This case is rare. It supposes the former cœnæsthesis completely done away, or at least forever inactive and incapable of resuscitation. When it is considered that *absolute* transformation of personality, *i.e.*, substitution of one personality for another—substitution complete, unreserved, without a link to connect the present with the past—presupposes a radical and thorough transformation in the organism, one is not surprised to find that it occurs but rarely. I am not aware of any case where the second personality has not inherited at least some small share of the effects of its predecessor—at the very least certain acquired faculties that have become automatic, as the power of walking, talking, and the like.

2d. Usually beneath the new bodily sense (cœnæsthesis) that has become organized and has become the groundwork of the exsiting Me, the old organic memory persists. From time to time it returns to consciousness, weak and faint like some memory of childhood that repetition has not reawakened. Probably this reviviscence is caused by some remainder of the old organic memory that is common to the two: the individual then seems another. The existing state of consciousness evokes a like one, but this has another accompaniment. The two seem *mine* though contradictory of each other. Such is the case with patients who find that everything is as it ever was, and yet that all is changed.

3d. Finally, there are cases of alternation. Here the two subjective memories

* *Diseases of Memory* (Humboldt Library No. 46.)

—the organized expression of the two cœnæstheses—persist, both in turn becoming predominant. Each is attended by, and sets in action a group of feelings and of physical and intellectual aptitudes that do not exist in the other. Each forms part of a separate *complexus*. The case reported by Azam is a good illustration of two memories alternating.

We can add nothing more without repeating what we have already said, or without heaping up hypotheses. Our ignorance of the causes stops us short. The psychologist is here like the physician who has to deal with a disease of which he can make out only the symptoms. What physiological influences are they which thus alter the general tone of the organism, consequently of the cœnæsthesis, consequently too of the memory? Is it some condition of the vascular system? Or some inhibitory action, some arrest of function? We cannot say. So long as this question remains undecided we are still only at the surface of the matter. Our purpose has simply been to show that memory though in some respects it may be confounded with personality, is not its ultimate basis.

Even in the normal state the same physical situation has a tendency to recall the same mental situation. I have often observed how, on falling asleep, a dream of the preceding night till then forgotten comes back to memory in great detail and very distinct. In traveling, when I leave one town to sleep in another, this recurrence of the previous night's dream sometimes takes place, but then the dream comes back piecemeal, disjointed, and hard to reconstruct. Is this the effect of the physical conditions, in one case alike, in the other slightly different? Though I have not seen this fact mentioned in any work upon dreams, I do not suppose it to be peculiar to me.

But there are certain familiar facts that are more conclusive. In somnambulism, whether natural or induced, the occurrences of preceding states of the same kind that are forgotten during wakefulness come back in the hypnotic state. Of this we have an illustration in the well known case of the porter who while intoxicated mislaid a parcel: on becoming sober he was unable to discover it, but he found it on getting drunk again. Do we not here see a tendency to the formation of two memories, one normal, the other pathological, the two pertaining to two distinct states of the organism, and constituting as it were the embryonic forms of the extreme cases already mentioned?

We have already shown in a general way the *rôle* of ideas in the transformation of personality. It remains to observe this new factor in operation and to ascertain what results it produces *per se* and distinctively. Of the many elements whose *consensus* constitutes the Me, none perhaps can be so easily isolated and studied apart. But we must guard against an ambiguity in terms. For the conscious individual the idea of his personality may be an effect or a cause; a result or a prime factor, a point of arrival or a point of departure. In the normal state it is always an effect, a result, a point of arrival. In the morbid state it is both an effect and a cause. In many of the instances already cited we have seen organic perturbations, whether affective or sensorial, produce such a feeling of exaltation or of depression, that the individual believes himself to be a god, a giant, a great man, or on the other hand a mere automaton, a phantom, a dead man. Clearly these erroneous ideas are a fairly logical conclusion from the inner transformation of the individual—the ultimate formula expressing it. There are other cases of a contrary nature, where the transformation of personality comes not from below but from above; where it is not completed in the brain but where it begins in the brain; and where accordingly the idea is, not a conclusion, but a premise. No doubt it were rash to assert that in many instances where an erroneous idea becomes the starting-point for a change in the Me, this has not underlying it and before it in time an organic or an affective perturbation. Indeed it must be affirmed that such is the case always; even in the hypnotized subject, in whom the personality is changed by suggestion. Between the two forms of metamorphosis indicated above there exists no clear line of demarkation: the term "ideal metamorphosis of personality" is only an *a priori* denomination. Having made this reservation, we will now examine this new aspect of our subject, starting as usual from the normal state.

A very common occurrence is the engrossment of the personality by an intense fixed idea. So long as this idea occupies the consciousness it is hardly an exaggeration to say that it is the individual. When a man is wrestling con-

tinually with a problem, or intent on working out an invention, or bending his energies toward the production of some original work in any field, his entire mental resources, his whole personality, are drawn upon for the benefit of one idea. In such cases, a man is overmastered by his dominant idea, that is, he is an automaton: he is in an abnormal state; there is a disturbance of equilibrium. Of this we have proof in the innumerable anecdotes that are current the world over about inventors, whether well balanced or half-crazed. And it may be remarked in passing that a fixed idea is a fixed sentiment, or a fixed passion. The fixed idea gets its intensity, its stability, its tenacity from some longing, some emotion of love or hatred, some consideration of gain. Ideas are ever servitors of the passions, but they are like those masters who always obey the while they think they command.

So far we have no change of personality, but only simple deviation from the normal type, or better, the schematic type, where *ex hypothesi* the organic, the affective, and the intellective elements produce a perfect *consensus*. There is hypertrophy at one point, atrophy at other points, conformably to the law of compensation. Let us consider morbid cases. Outside of the artificial alterations produced during hypnotism it is difficult to find any great number of cases in which the starting-point is indisputably an idea. But I think I am justified in classing among changes of personality having their source in the intellect the phenomena of lycanthropy and of zoanthropy; once so common, now rare. At all events, in every instance of which we have authentic record * the mental debility in the *lycanthrope* is so great, and so near akin to stupidity, that one is disposed to see here a case of reversion, of return to the purely animal individuality. We may add that as these cases are complicated with disorders of the viscera, and with hallucinations of touch (*cutanées*) and of sight, it is not easy to decide whether they are the effects of a preconceived idea, or whether they themselves produce it. Still it must be remembered that lycanthropy has sometimes been epidemic, that is, it must have begun, at least among the imitators, with a fixed idea. Finally, this particular malady disappeared when men had ceased to believe in it—when the thought that he was a wolf could no longer find a lodgment in a man's brain.

The only perfect instances of transformation of the personality by ideas (*transformation idéale*) are those already mentioned, where men believe themselves to be women, and *vice versa*, without presenting any sexual anomaly that could account for this metamorphosis. The influence of an idea appears also to be initiative or preponderant with the possessed, demoniacs. It often acts upon the exorcist by contagion. To cite one instance of this, Father Surin, so long mixed up with the well-known doings at the Loudun Ursuline nunnery, was convinced that he had two souls, and sometimes, as it would appear, even three.†

In short, transformation of personality through the dominance of an idea are not very frequent, and this affords new proof of what we have again and again repeated: that personality comes from the more fundamental psychic elements. In the higher nerve centers it attains its unity and there does it come to full consciousness of itself, there it reaches perfection. If by a mechanism acting in the reverse direction it proceeds from above downward, the result is superficial, precarious, momentary.

Of this we have a demonstration when artificial personalities are produced in hypnotized subjects. The observations of Ch. Richet on this subject are full and conclusive.‡ I will sum them up briefly.

* See Calmeil, *De la Folie Considérée sous le Point de Vue Pathologique, Philosophique, Historique, et Judiciaire*, vol. 1, book 3, chap. 2, and book 4, chap. 2.

† He has left us a detailed account of his mental state in his *Historie des Diables de Loudun*, p. 297 *et seq.*: "I cannot describe to you what passes within me during this time [*i. e.*, when the demon passes from the body of the possessed nun into his body] and how this spirit unites with mine, without depriving me either of the cognition or of the liberty of my soul, nevertheless making himself like another *me*, and as though I had two souls whereof one is dispossessed of its body and of the use of its organs and stands aside, looking on while the intruder makes herself at home. The two spirits fight on one field, which is the body, and the soul is as it were divided in twain: in one part of her, she is the subject of the diabolic impressions: in the other, she is the subject of the motions that are proper to her or that God gives her. When I would, by the motion of one of these two souls, make the sign of the cross upon my lips, the other turns my hand away very rapidly, and seizes my finger with the teeth to bite it in its rage. * * When I would speak my speech is checked; at the mass I am stopped quite short; at the table I cannot raise a morsel to my mouth; at confession, I suddenly forget my sins, and I feel the devil going and coming within me, as in his own house."

‡ *Revue Philosophique*, March, 1883. He gives some later observations in his work, *L'Homme et l'Intelligence*. See also Carpenter, *Mental Physiology*.

The hypnotized subject (usually a woman) is made to believe herself to be, now a peasant, again an actress, or a general, an archbishop, a nun, a sailor, a little girl, and so forth; and she acts her part without any misgiving. Here the psychological data are perfectly clear. In this state of artificially produced somnambulism the real personality is intact; the organic, affective, and intellectual elements have undergone no considerable alteration, but they all remain *in posse*. A certain not well understood state of the nerve centers, an arrest of function, prevents them from passing into act. By suggestion an idea is evoked; instantly by the mechanism of association, this awakens analogous states of consciousness, and no others; and in connection with them—always by association—the appropriate gestures, acts, speech and sentiments. In this way is constituted a personality external to the real personality, made up of borrowed elements and depending on automatism. This experiment shows what an idea may do when freed from control by other ideas, but at the same time reduced to its own sole forces, and no longer supported and aided by the totality of the individual.

In some cases of imperfect hypnotism dualism is produced. Dr. North, professor of physiology in the Westminster Hospital, says, in speaking of the period of hypnotization when he was being influenced by the fixing of the gaze:—"I was not unconscious, but it seemed as if I lived as two beings. I fancied that an inner Me was alive to all that was passing, but that it took no part in the acts of the outer Me, nor had any care to control them. The repugnance or the inability of the inner Me to direct the outer Me seemed to increase as the situation was continued."*

Can this inner personality—the true personality—ever be entirely suppressed? Can the individual's proper character be reduced to nought, so as to be transformed into its opposite? No doubt it can: the operator, by persistent enforcement of his authority, succeeds in doing this, after more or less resistance. Richet impressed upon a woman who was a very strong Bonapartist strict republican convictions. Braid having hypnotized a "teetotaler," whose sobriety was without reproach, assured the man again and again that he was drunk. "This assertion was strengthened by a feeling of staggering (produced by muscular suggestion) and it was amusing to see the man wavering between this imposed idea and the conviction resulting from his habits." This momentary metamorphosis however is perfectly innocuous. As Richet justly remarks:—"In these curious modifications what changes is simply the outer form, the habits and general demeanor, and not the individuality proper." As for the question whether by repeated suggestions to susceptible subjects, we might be able at length to produce a modification of the character . that is a problem to be solved by experiment alone, and that is beyond our present purpose.

Here perhaps is the place to note the fact of the *disappearance of personality*, a phenomenon that has been described by the mystics of every age, according to their own experience, and often in elegant language.† The pantheistic meta-

* Hack Tuke, *On the Mental Condition in Hypnotism*, published in the *Journal of Mental Science*, April, 1883. We have also in this article the case of a physician who, during a troubled slumber after some twenty hours of climbing among the Alps, dreamt that he was twain: one Me had died, the other was making the autopsy. In some cases of intoxication and of delirium, the psychic coördination disappears, and there is a kind of scission of the personality in two. See the articles by Dr. Azam on changes of personality (*Revue Scientifique*, Nov. 17, 1883) and of Dr. Galicier (*Revue Philosophique*, July, 1887). Taine gives a curious case of semi-pathological incoördination:—"I have seen a person who, while singing or talking writes, without looking at the paper, consecutive phrases, even whole pages, quite unconscious of what she is writing. In my opinion she is perfectly sincere, yet she declares that when she comes to the end of the page she has no idea what she has set down on the paper. On reading it she is amazed, sometimes alarmed. The handwriting differs from her ordinary style. The movement of the fingers and of the pencil is stiff and seems automatic. The writing always ends with a signature, the name of one who is dead and it bears the impress of a mental background [*arrière-fond mental*] that the author would be unwilling to divulge." (*De l'Intelligence*, 3d edition, preface).

† I will quote only one of these descriptions, and that one because by its style of language and its date it comes nearest to our own time. "I seem to have become a statue on the banks of the stream of time, and to be assisting at some mystery, whence I shall go forth aged or ageless. I feel myself to be without name, impersonal, with the staring eyes of a corpse, with mind vague and universal like nothingness or the absolute: I am in suspense, I am as if non-existent. In such moments it seems to me that my consciousness withdraws into its eternity * * * it sees itself in its very essence, superior to every form containing its past, its present, and its future [sees itself as the] void which encompasses all, an atmosphere (*milieu*) invisible and fecund, the virtuality of a world which detaches itself from its own existence to regain itself (*se ressaisir*) in its pure inwardness (*intimité pure*). In those sublime moments the soul re-enters herself, goes back again to indetermination; she becomes *retro-voluted* (*Sit venia verbo*. The original has *s'est réimpliquée*. Translator) beyond her own life, she becomes again a divine embryo. All is ef-

physicians, too, without attaining to ecstasy, speak of a state in which the mind thinks of itself "under the form of eternity," appears to itself as outside of time and space, as free from all contingent modality and forming one with the infinite. This psychological situation, though infrequent, must not be forgotten. To me it seems as an absolute engrossment of the mental activity by a single idea (in the mystics a positive one, negative in the empirics) which idea, from its high degree of abstractness, and from its being exempt from all determination and limitation, contradicts and excludes all feeling of individuality. Let but one sensation, however commonplace, intervene, and the illusion disappears. This state is neither above the personality nor below it, but without and beyond.

To sum up, the states of consciousness called ideas are only a secondary factor in constituting personality and in changing it. Ideas play their part, but it is not a predominant one. These results do not agree with the time-honored teachings of psychology. Ideas have an objective character: hence they cannot express the individual as do his desires, his feelings, his passions.

CHAPTER V.

DISSOLUTION OF PERSONALITY.

To complete our review of the facts, we have yet to treat of alterations of personality in progressive dementia caused by old age, general paralysis, and all other morbid causes. If in the normal state personality is a psycho-physiological coördination of the highest degree possible, which endures amid perpetual changes and partial and transitory incoördinations (such as sudden impulses, eccentric ideas, etc.), then dementia, which is a progressive movement toward physical and mental dissolution, must manifest itself by an ever increasing incoördination till at last the Me disappears in absolute incoherence, and there remain in the individual only the purely vital coördinations—those best organized, the lowest, the simplest, and consequently the most stable, but these in turn disappear also. And it is perhaps in these states of progressive and inevitable dissolution alone that we find instances of double personality in the strict sense, that is, of *co-existent* personalities. In the course of this work we have seen cases of successive personalities (cases mentioned by Azam, Dufay, Camuset); of a new personality supplanting another that is forgotten or thrust out and held to be extraneous and foreign (the case cited by Leuret, and that of the soldier of Austerlitz); of an invasion of the normal personality by unwonted sensations which it resists with more or less success, and which *at times*, and *momentarily* lead the patient to think himself twain (cases noted by Krishaber, etc.) But in the subjects of dementia disorganization becomes organized: the demented are double in personality, think themselves double, act as double personalities. This admits of no doubt. They retain no trace of that indecision which, in the numerous cases we have cited, shows that the normal personality (or what remains of it) possesses some remainder of strength which, weeks or months later, will insure its return. To the demented it seems as natural to be double as to us to be of one personality. Such individuals have no skepticism as to their own state and do not regard the opinions of others. Their mode of being, given to them by their consciousness, seems so clear to them, so evident, as to be above all question. This point is worthy of notice because it shows in these morbid forms of personality, that spontaneousness of affirmation and of action which is characteristic of every natural state. Here are two cases of this kind:

A retired soldier, D——, who afterward was a police sergeant, having been several times struck on the head, lost his memory by degrees, and at last was sent to an asylum. His mind becoming more and more affected, at last he came to think himself double.

"In talking he always uses the pronoun *we*: *we* will go, we have made a long march, etc. He uses this form of speech, he says, because there is another with him. At the table he says, 'I have had enough, but the other is still hungry.' Sometimes you see him running, and if you ask why, the answer is that he would rather sit still, but 'the other' makes him run. One day he attempted to choke a child to death, saying it was not himself but 'the other' that was to blame. At last he attempted his own life to

faced, dissolved, dissipated, resumes the primordial state, is immersed again in the original fluidity without form, or angles, or fixed contours. This state is contemplation, not stupor; it is neither painful, nor joyous, nor sad; it is beyond all special feeling and sentiment, as it is beyond all finite thought. It is the consciousness of Being (*l'être*) and the consciousness of the omnipossibility latent in the depths of that Being. It is the sense of spiritual infinitude." Amiel, *Journal Intime*, 1856.

slay 'the other,' whom he supposes to lie hid in the left side of his body. Hence he calls 'the other' the left D—— while he himself is the right D——. This patient soon fell into dementia." *

A case reported by Langlois exhibits a still lower grade.

"The man G—— is imbecile, loquacious, with no hesitation in utterance, no paralysis of the limbs, and no disturbance of the cutaneous sensibility. Though he talks continually he does but repeat the same stereotyped phrases. He always speaks of himself in the third person, and almost every morning greets us with 'G—— is sick, he must go to the infirmary.' Often he goes upon his knees, and gives himself a sound pummeling; then bursts out laughing, and rubbing his hands exclaims, 'G—— has been bad, he has had to do penance.' Often he will take up his wooden shoe, and beat himself violently on the head, or he will bury his nails in his flesh, or will scratch his face. These fits of rage come on suddenly, and while he is disfiguring himself his countenance is expressive of anger, but it wears a look of satisfaction, as soon as he has done correcting the other. At times when he is not overwrought by these imaginary resentments, we ask him 'Where is G——?' 'Here he is,' he answers, striking his breast. We touch his head, asking whose that is. 'That,' he answers, 'is the pig's head.' 'Why do you beat it so?' 'Because I must punish the pig's head.' 'But you just now struck G——.' 'No. G—— is not a bad boy to-day: it is the pig's head that has to be beaten.' For many months we asked him the same questions, and the answers were ever the same. Generally it is G—— that is displeased, but sometimes it is the other, and then it is not the head that is punished." †

A certain subject of general paralysis, in a condition bordering on dementia, used to be continually giving himself advice, or reproaching himself. "Mr. G——," he would say, "you are aware that you have been placed in this institution, and here you are. We tell you that we have no hope whatever of you," etc. As the general paralysis progressed his words became less intelligible, but in his raving this conversation with himself could always be made out. Sometimes he both asked the questions and answered them. When dementia had reached almost the last degree, he kept up the same practice. He would cry out, and show signs of agitation, but immediately growing calm would say in a low voice, and with a significant gesture, "Won't you be still; speak low." Then he would answer, "Yes, I am going to speak low." "Once we found him very busy, making all the motions of tasting [wines, etc.], and spitting out. We asked him, 'You are amusing yourself, Mr. G——?' 'Which?' was his reply, and then he relapsed into incoherence. This reply, repeated here literally, may seem to be the result of chance, but it accords so well with the duality so long observed in this patient, that we have deemed it worthy of mention." ‡

In the following case the dissolution of personality is presented in a new aspect: the individual has no consciousness of a portion of himself, which is become foreign to him, or hostile. We have already, while speaking of hallucinations, seen the patient coming by degrees to embody his hallucinations, and finally giving them objective existence. In the demented the case is more serious. The acts and states that are perfectly normal for a person of sound mind and that have none of the morbid or imaginative characters of hallucination, are for the subject of dementia something external to himself, nor is he conscious that he is himself their cause. How may we account for this curious situation without supposing a profound change in the cœnæsthesis, and that certain portions of the body are no longer represented—or sensed—in the ruined brain. The sense of sight remains, as experience proves, but the patient sees his own movements as an external, an antagonistic phenomenon which he attributes neither to himself nor to others; which he notices passively without more ado, because his internal sensations being effaced and his reasoning power reduced to impotence, there is no means of correcting this incoördination.

Then we have the case of a general paralytic in the period of dementia, whose speech was almost unintelligible, and of

* Jaffe, *Archiv für Psychiatrie*, 1870.

† *Annales Médico-Psychologiques*, vol. VI., p. 80.

‡ Descourtis, *Du Fonctionnement des Opérations Cérébrales, et en particulier de leur Dédoublement dans les Psychopathies*, Paris, 1883, p. 33. Possibly this second personality which advises and admonishes the other is only the purely passive reproduction of the phrases addressed to the patient by his physician or his attendants. It may be remarked that not seldom the demented speak of themselves in the third person. The same is seen in young children, and it has been accounted for by the fact that their personality is not yet formed. In my opinion we have here simply imitation. The infant is used to hearing such remarks as these: "Paul has been bad, he must get a whipping," etc. He thus learns to speak of himself in the same way. Is the use of the third person by some subjects of dementia a sign of reversion?

whose notions of the external world but little remained.

"One day he was employed in picking peas. Though inexpert, and naturally right-handed, he employed only the left hand. Once the right hand came forward as though to take its share of the work, but hardly had it touched the peas when the other hand came down upon it, seized it and gave it a hard squeeze. The patient's countenance meanwhile bore an expression of anger and he repeated in a tone of authority, 'No, no.' His body trembled and shook with passion and it was plain that a violent struggle was going on within him. On another occasion he had to be tied down in an armchair. His countenance grew clouded, and seizing his right hand in his left, he exclaimed: 'There! It is all your fault; on your account they have tied me here,' and he struck the offending hand again and again. Nor were such occurrences exceptional. Many times it was observed that on the right hand quitting its habitual state of inactivity the patient checked it with the left. He would become angry and excited, and would beat it with all the strength he had." *

Some demented patients blame their fellow patients for the noise they themselves make, and complain of being disturbed by their cries. Finally, we will quote the case, observed by Hunter, of an old man, whose faculties were very much impaired. He always referred to the present time the occurrences of his early life. Though he was capable of acting correctly upon certain impressions, and of referring them to the portions of the body affected by them, he habitually attributed his own sensations to those around him. Thus he would tell his keeper and the attendants that he was sure they were hungry or thirsty. But when food or drink was offered him, it became apparent that this absurd idea had been suggested to him by his own feeling of hunger and thirst, and that the word *they* referred to himself, not to others. He had frequent violent fits of coughing, after each of which he would resume the thread of his conversation, first expressing in appropriate and sympathetic terms his concern on account of his friend's complaint. "It grieves me," he would say, "to see *you* suffering from so troublesome and so distressing a cough." †

Little by little all these cases steadily advance toward absolute incoördination and complete incoherence. They come to resemble congenital imbecility that has never been able to reach the mean level of human personality. In the gradual and progressive coördination which constitutes normal man, the idiot has met with arrest of development. In him the evolution has not preceded beyond the early stages: it has made provision for the physical life and some few elementary manifestations of the psychic life; but the conditions of an ulterior development are lacking. We have now in conclusion to consider this fact of coördination as the groundwork of personality.

But we must first attempt a rapid classification of the perturbations of personality of which we have given so many illustrations, all so different from one another that it might seem impossible to refer them to a few fundamental types.

Though in the normal state the bodily sense (cœnæsthesis) undergoes different changes in the course of one's life—in the evolution which goes on from birth to death—this change is usually so slow, so continuous, that the assimilation of new sensations proceeds little by little, and the transformation is brought about insensibly, so producing what we call identity, *i.e.*, apparent permanence amid incessant variations. Nevertheless all serious maladies, as well as all profound changes (puberty, change of life) import more or less of indecision: between the new state and the old there is not immediate fusion and as it has been well expressed, "at first these new sensations present themselves to the old Me as an extraneous Thee." But should the general bodily sense (cœnæsthesis) be modified suddenly; should there be a large instantaneous influx of unwonted states, then the fundamental element of the Me is completely transformed: the individual is parted from his prior personality, and he appears to himself like another. More usually there is a period of disturbance and incertitude, and the break is not instantaneous. When the morbid state has become fixed, one or other of these three principal types of diseases of personality will be presented:

1. The general bodily sense is changed completely. The new state serves as basis for a new psychic life (new ways of sensing, perceiving, thinking, hence a new memory). Of the former Me there remain only the completely organized processes (language, manual dexterity, power of walking, etc.), activities that are

* Descourtis, Op. cit., p. 37.
† Hunter, quoted by Winslow, *Obscure Diseases of the Brain*, p. 278.

purely automatic and almost unconscious, faculties that are like slaves ready to serve any master. But it must be remarked that in reality this type is subject to exceptions. Sometimes a portion of the automatic acquisitions are not transferred to the new Me. Again, at long intervals, some few traces of the old personality reappear, and produce momentary indecision in the new. Looking at the matter as a whole, and disregarding slight deviations, we may say that here we have an *alienation* of personality, the old personality having become alien to the new, so that the individual has no knowledge of his former life, or, when he is reminded of it, regards it objectively, as something apart from him. Of this we see an excellent example in the woman inmate of La Salpêtrière who ever after her forty-eighth year spoke of herself as "the person of myself" (*la personne de moi-même*). She gave a fairly correct account of her former personality, always, however, identifying it with another. "*La personne de moi-même* does not know the one that was born in 1779"—her former personality.* The case of Father Lambert belongs also to this type. Hack Tuke tells of a patient at the Bedlam hospital who had lost his Me, that is, the Me that was familiar to him, and would often go looking for himself under his bed. †

2. The second type has for its fundamental character *alternation* of two personalities, and to this type in particular properly belongs the current designation of double consciousness. As we have said, there are transition forms intermediate between the first type and this one, but at present we are concerned only with what is clear and well defined. The physical cause of this alternation is very obscure, unknown we may say. At the point where the new personality first appears, this case differs in nothing from those of the preceding class: the difference begins when the first personality reappears. The hypothesis seems inevitable, that in these subjects (who as a rule are hysterical, that is to say instable in a high degree) there exist, with secondary variations, two distinct habits in the physical life, each serving as groundwork for a psychic organization. The hypothesis appears all the more probable when it is remarked that the alternation bears upon character, the thing that in personality is inmost, and which most fully expresses the individual nature. (Cases observed by Azam, Dufay, Camuset.)

Of this alternation type too, we have different forms. Sometimes the two personalities know nothing of each other (Macnish). Again, one touches the whole life, while the other is but partial: such is the case observed by Azam. In this case, the most instructive of all because it now covers a period of twenty-eight years, we see the second personality continually encroaching upon the first. In the beginning, the duration of the first personality was very protracted, but by degrees it has come to be shorter and shorter, so that in time it promises to disappear entirely, leaving the second to stand alone. It would hence appear that this state of alternation, when prolonged, tends necessarily to be converted into the first type: thus it holds a place intermediate between the normal state and complete alienation of personality.

3. The third type is more superficial: I will call it *substitution* of personality. To this type I refer the rather frequent case of individuals imagining themselves to have changed from one sex to the other —from man to woman, and *vice versa*, or from ragman to king, etc. The state of certain hypnotized subjects already mentioned may serve as an example of this whole class. The alteration is rather psychical, in the narrower sense of the term, than organic. I do not for a moment suppose that it arises, or that it persists, without material conditions. I mean only to say that it is not caused and maintained, like the other two groups, by any profound modification of the cœnæsthesis, involving a complete transformation of the personality. It arises from the brain, and not from the inner recesses of the organism. It is a local rather than a general disorder—the hypertrophy of a fixed idea, which makes impossible that coördination which is necessary for the normal psychic life. Hence, while in alienation and alternation of personality all conspires and co-operates, exhibiting the inner unity and logic of the organic processes, here, oftentimes, the one who says he is a king admits that he has been a laborer, and the imaginary millionaire that once he earned only a couple of francs a day. Even outside of cases where the incoördination is manifest, we see that a fixed idea is a weak excrescence which does not at all imply total transformation of the individual.

* See the full details in Leuret, *Frag. Psychol.*, pp. 121–124.

† *Journal of Mental Science*, April, 1883.

This classification, proceeding from the gravest forms to the slightest, does not pretend to be rigorously exact. It may serve to array the facts in something like order, and to show how they differ, and especially to show once again that personality has its roots in the organism, undergoing like it change and transformation.

CHAPTER VI.

CONCLUSION.

IT follows necessarily from the doctrine of evolution that the higher forms of individuality must have arisen out of the lower by aggregation and coalescence. It follows, also, that individuality in its highest degree, in man, must be the accumulation and condensation in the cortical layer of the brain, of elemental consciousnesses that originally were autonomous and dispersed through the organism.

The different types of psychic individuality in the animal scale, from lowest to highest, cannot be described and defined save by a zoo-psychologist who makes his way cautiously through the tangle of facts, often trusting to conjecture. Hence we cannot do any more here than to note a few forms, in view of the principal aim of this work, which is to show that the ascending progress toward higher individuality is ever toward greater complexity and coördination.

There is no plainer term than "individual," when there is question of a man, a vertebrate animal, even an insect: but no term is more obscure as you descend the scale: on this point all zoologists are agreed.* According to its etymology, that is individual (*individuum*) which is not divided. The individual, in this sense, must be sought far down in the scale. While there are no limits to the dimensions of inorganic compounds (crystals), "every protoplasmic mass having a maximum diameter of a few tenths of a millimeter splits up spontaneously into two or more distinct masses equivalent to the mass from which they come, and which in them is reproduced. Hence, protoplasm does not exist save in the individual state, having a limited magnitude, and hence it is that all living things are necessarily made up of cells."† Life never attains any considerable augmentation except through the indefinite repetition of this fundamental theme, by the aggregation of an infinite number of these minute elements, true types of individuality.

The living, homogeneous matter which constitutes these elemental, primordial individualities, expands, contracts, draws itself out in slender filaments, creeps up to substances capable of affording it nourishment, involves them in its own substance, decomposes them, and assimilates their *débris*. We hear of "rudiments of consciousness" in this connection—of a sort of will reaching its determinations through external stimulations, and of vague wants. One may employ the term for want of a better, but let him not forget that it has for us no precise signification. In an homogeneous mass presenting not the slightest trace of differentiation, and in which the essential vital properties (nutrition, generation) are in a diffused, indistinct state, the sole representative (and it is a lowly one indeed) of psychic activity is the irritability common to all living things, and which will later, in the course of evolution, become general sensibility, special sensibility, and so on. May we call it a consciousness?

The first step toward a higher individuality consists of an association of individuals almost completely independent of one another. "The forced contiguity, the continuity of tissues, the nearly constant unity of the digestive apparatus, establish between them a number of relations, and these prevent the several individuals from remaining altogether strangers to what is taking place among their next neighbors: such is the case with sponges, colonies of Hydra polypes, corolla polypes, bryozoa, and some colonies of ascidia."‡ But this is, properly speaking, only a juxtaposition of a number of contiguous, homogeneous consciousnesses, having between them nothing in common save the limitation of their aggregate in space.

The rise of the *colony* individuality, and of the *colony* consciousness marks a great step toward coördination. The colony, made up of elemental individuals, has a tendency toward transformation into an

* See in particular Häckel, *General Morphology*, I., p. 241 (French trans.); Gegenbaur, *Comparative Anatomy*, p. 24 et seq. (French trans.); Espinas, *Sociétés Animales*, 2d ed., Appendix II.; Pouchet, *Revue Scientifique*, 10 Feb., 1883.

† Perrier, *Les Colonies Animales et la Formation des Organismes*. Paris, 1881, p. 41. According to Cattaneo, *Le Colonie Lineari e la Morfologia dei Molluschi*, the division is carried farther still.

‡ Perrier, Op. cit., p. 774; Espinas, *Sociétés Animales*, section 2.

individuality of a higher order, in which there shall be division of labor. In colonies of Hydractinia we find seven different kinds of individuals—the nurses, the sexed individuals (male, female), those which capture prey, etc. In the Siphonophora and allied types, the faculty of locomotion is perfectly centralized: the individuals seem independent as long as the animal lets the common axis float about, on which they are implanted: but when any danger impends, or if the animal is to perform any complex movement, then the axis contracts, carrying with it all the polypes. The Prysalia knows how to quicken or to slacken its movement, can at will rise above the surface, or descend below it, can move straight ahead, or turn about, all its organ-individuals concurring to perform these complicated acts. The wandering life of these creatures, as Perrier remarks, favors the development of individuality.

"From it necessarily results greater interdependence of the individuals; closer ties are formed between them; impressions produced upon any part of the whole must necessarily be transmitted to the locomotive air-bladders; and the movements of these must needs be coördinated, else all is disorder. Hence arises a sort of 'colony consciousness,' and this tends to produce a new unity, to form what we call an individual." *

In other colonies the common consciousness has its rise in a different way. In Botrylus, a genus of Tunicata, there is a common orifice, which is the cloaca around which all the individuals are arranged. Each of these sends out in the direction of the cloaca a tongue-shaped process provided with nerves, whereby communication can be established permanently between all the members of a group. †

"But it by no means follows that because a colony gains the notion of its existence as a colony, therefore each of the individuals composing it loses its particular consciousness. On the contrary, each of these continues to act as if it stood alone. In some star-fishes, each severed branch keeps moving on, or turns aside, as the occasion may require: in short, appears to be conscious. Nevertheless, the consciousness of each of the rays is subordinate to the consciousness of the star-fish, as is proved by the harmony between the movements of the several parts when the creature changes position." ‡

It is difficult for man, in whom centralization is carried to so high a degree, to have anything like a clear idea of a mode of psychic existence in which partial individualities co-exist with a collective individuality. We might find some analogon in certain morbid states. So too it might be said that the human individual has consciousness of himself both as a person and as a member of the body social. But I do not wish to make comparisons that might be contested. But looking at the question objectively and from without, we see that this "colony consciousness," however imperfectly coördinated, however intermittent it may be in the beginning, has profound significance as regards evolution. It is the germ of the higher individualities, of personality. It will, little by little, rise to the highest grade, turning to its own advantage all these special individualities. In the political order we see a like evolution in thoroughly centralized governments. There the central power, at first very weak and hardly recognized, oftentimes inferior to that of the constituent parts, or provinces, gains strength at their expense, and by degrees absorbs them.

The development of the nervous system, which is the coördinating agency *par excellence*, is the visible sign of an advance toward a more complex and a more harmonious individuality. But this centralization is not brought about in a moment. In the Annelida the brain-like ganglia which send out nerves to the organs of sense seem to perform the same functions as the brain in vertebrates. but these ganglia are by no means fully organized. The psychological independence of the several rings is very evident. "Consciousness, while pretty distinct in the brain, seems to grow fainter in proportion as the number of rings is greater. Some species of Eunice, which often attain a length of five or six feet, bite the posterior part of their own bodies without appearing to notice it. To this diminution of consciousness no doubt we must attribute the fact that Annelids kept in captivity, under unfavorable conditions, readily prey upon themselves." In linear colonies, the individual that holds the front position, since it has to give the initiative, to advance or to retreat, to modify the gait of the colony which it draws after itself, becomes a *head*; but the term *head* is here employed by zoologists analogically only, and we must not suppose it to have the same meaning as when we speak of the

* Perrier, Op. cit., p. 232.
† Id. ibid., p. 771.
‡ *Ibid.*, pp. 772, 773.

head of an insect or of any articulate animal. The individuality it represents is so indefinite that in certain annulates, made up of forty rings or more, we may see the head of a sexed individual appearing at the level of the third ring, acquiring tentacles and antennæ, then separating itself from the original individual, and setting up for itself.*

For details the reader is referred to special treatises. As regards the higher animals, there is no need to dwell upon the subject: in them individuality, in the received meaning of the term, is established, being represented by the brain, which becomes more and more predominant. This *excursus* over the domain of zoology will not have been in vain if it shall have taught us that this coördination, of which we have had so much to say, is not a mere subjective view, but on the contrary an objective fact, visible and tangible; and that, in the words of Espinas, the psychic individuality and the physiological individuality are parallel—that consciousness becomes unified or diffused with the organism. Nevertheless the term "consciousness," or "psychic individuality" is highly ambiguous. If the psychic individuality is, as we maintain, simply the subjective expression of the organism, then the farther we go from the human type, the greater is the obscurity that surrounds us. Consciousness is a function that may be compared to generation, inasmuch as they both express the whole individual. Grant that the most elementary organisms possess a consciousness, and that like all their vital properties, and generation in particular, it is diffused throughout their physical structure: now as regards generation, we see that this function, as the animal grade rises, becomes localized, and appropriates a part of the organism, and that this part, after countless modifications, becomes, with respect to that function and that alone, the representative of the whole organism. The psychic function takes a like course. In its highest grade it is strictly localized, and has appropriated to itself a part of the organism which becomes, for that function and for it only, the representative of the whole organism. In virtue of a long series of successive transfers of function, the brain of the higher animals now concentrates in itself most of the psychic activity of the colony; it has been entrusted, so to speak, with one function after another, till at last its associates have made complete abdication in its favor.† But take at random any species of animal, and who shall say to just what degree this delegation of psychic functions has in it proceeded. Physiologists have made many experiments upon the spinal cord in frogs. is its psychic value relatively the same in man? We may well doubt it.

Return we to man, and let us consider first his purely physical personality. We will for the nonce eliminate all states of consciousness, and will consider only the material groundwork of personality.

1. There is no need to show at length the very close relations subsisting between all the organs of the so-called vegetative life—the heart, vessels, lungs, intestinal canal, liver, kidneys, etc.—however foreign they may appear to be one to another, and however much engrossed with their several tasks. The multitudinous agents in this coördination are centripetal and centrifugal nerves of the great sympathetic and of the cerebro-spinal system (the difference between these two tends to disappear) together with their ganglia. Is their activity restricted to the simple molecular disturbance which constitutes the nervous influx, or has it also a psychic, conscious effect? No doubt it has such an effect, in morbid cases: it is then *felt*. In the normal state it simply calls forth that vague consciousness of life of which we have so often spoken. But vague or not, that is of no importance. May we maintain that these nerve actions, which represent the totality of life, are the fundamental facts of personality, and that, as such, their value is, so to speak, in inverse ratio to their psychological intensity? They do far more than just to call forth a few transitory, superficial states of consciousness; they shape the nerve centers, give them tone, give them a habit. Consider for a moment the enormous power of these actions (feeble though they appear) going on unceasingly, untiringly, repeating forever the self-same theme with few variations. Why should they not result in forming organic states, that is (as implied in the definition of "organic") stable and continuous states which shall represent, anatomically and physiologically, the inward life? Of course all this does not depend on the viscera alone, for

* Perrier, Op. cit., pp. 448, 491, 501.

† Espinas, *Les Sociétés Animales*, p. 520.

the nerve centers too have their own proper constitution, in virtue of which they react. They are not merely receptive but incitative also, and they are not to be separated from the organs they represent, and with which they form one whole: between both there is reciprocity of action.

Where do all these nerve actions come together and meet? where do we find the *résumé* of the organic life? We know not. Ferrier thinks that the occipital lobes have a special relation to the sensibility of the viscera, constituting the anatomical substratum of their sensations. Taking this view simply as a working hypothesis, it follows that by successive stages, by one transfer after another, the visceral life has at last found here its ultimate representation; that it is writ here in a language unknown to us indeed but which expresses the inward individuality and that only, to the exclusion of all other individuality. But in truth whether this anatomic representation exists in the occipital lobes or elsewhere, and whether it be localized or diffused, does not affect our conclusion, provided only it exists. I have the less hesitation in dwelling on this subject, because this coördination of the multitudinous nervous actions of organic life is the groundwork of the physical and psychical personality, since all the other coördinations are based upon this; because this coördination *is* the inner man, the material form of his subjectivity, the ultimate reason of his feeling and action, the source of his instincts, sentiments and passions, and in the language of the mediæval schoolmen, his principle of individuation.

To pass now from the inward to the outward, the periphery of the body forms a surface over which the nerve terminals are unequally distributed. Whether few or many, the nerve filaments receive and transmit from the different parts of the body impressions (that is to say, molecular disturbances); are centralized in the spinal cord, and thence pass to the medulla oblongata and the pons Varolii. There a new contingent is added—that from the cranial nerves: and now the transmission of sensorial impressions is complete. We must not overlook the centrifugal nerves, which act in a similar way, but in the direction of an increasing decentralization. In short, the spinal cord, which is a string of superposed ganglia, and more particularly the medulla oblongata with its special centers (of respiration, phonation, deglutition, etc.), while they are all organs of transmission, represent the reduction to unity of a vast multitude of nervous actions diffused throughout the organism.

At the point we have reached the question becomes full of obscurity. The mesencephalon seems to possess a more complex function than the medulla oblongata, and that a more complex function than the spinal cord. The corpora striata would seem to be the center in which are organized the habitual or automatic actions, and the optic thalami to be the point where the sense impressions are reflexed in movements.

However this may be, we know that the fasciculated portion of the crus cerebri, a bundle of white brain substance continuous with the peduncle, traverses the opto-striate bodies, penetrating into the strait between the optic thalami and the lenticular nucleus, and that it branches out in the hemisphere, forming the corona radiata of Reil. It is a pathway over which pass all the sensorial and motor fibers running to or from the opposite side of the body. The anterior portion contains only motor fibers. The posterior portion contains all the sensorial fibers, a certain number of motor fibers, and all the fibers coming from the sense organs. The bundle of sensorial fibers having received its full complement, divides into two: one portion ascends to the fronto-parietal convolution; the other is turned back to the occipital lobe, and the bundle of motor fibers is distributed through the gray cortex of the motor zones.

These details, tiresome as they will be to the reader despite their brevity, show the close interdependence of the different parts of the body and the cerebral hemispheres. Here the study of the localization of functions, though not yet carried very far, has settled a few points, as that there is a motor zone (formed of the ascending frontal and ascending parietal convolutions, the paracentral lobe, and the base of the frontal convolutions) in which are represented the movements of the different parts of the body; and that there is a sensitive zone far less clearly defined (embracing the occipital lobes and the temporo-parietal region). As for the frontal lobes, we have no definite knowledge with regard to them, but we may in passing notice the hypothesis recently offered by Dr. Hughlings Jackson that they represent, with respect to the other centers, combinations and coördi-

nations of a more complex kind, being thus a representation of representations. *

We cannot notice past and present discussions upon the physiological and psychological *rôle* of these centers: to do so would require a volume. But we may say that the cortical substance represents all the forms of nerve activity—visceral muscular, tactile, visual, auditory, olfactory, gustatory, motor, significatory. This representation is not direct. An impression does not go from the periphery of the brain as a telegram goes from one office to another near by. In one case, where the spinal cord was reduced to the size of a goosequill and the gray substance was extremely small, the subject possessed sensation.

But though indirect or even doubly indirect, this representation is, or may be, a total representation. Between the equivalents of these nervous actions distributed throughout the body there exist innumerable connections—commissures between the two hemispheres and between the several centers of each hemisphere—some of them innate, the others established by experience, having all possible degrees, from highly stable to highly instable. The physical personality, or in more precise language, its ultimate representation, thus appears to us not as a central point whence all radiates and where all converges—Descartes's pineal gland—but as a wonderfully complex net-work where histology, anatomy and physiology are baffled every moment.

From this very imperfect sketch the reader may see that the terms consensus, coördination, are not mere *flatus vocis*, abstractions, but that they truly express facts.

Let us reinstate now the psychic element hitherto eliminated, and note the result. It must be remembered that according to our view consciousness is not an entity, but a sum of states each of which is a specific phenomenon dependent on certain conditions of the brain's activity; that it is present when these are, is lacking when they are absent, disappears when they disappear. It follows that the sum of a man's states of consciousness is far inferior to the sum of his nerve-actions (that is, his reflex actions of every kind, from the simplest to the most composite). A period of five minutes may embrace a multitude of sensations, feelings, images, ideas, acts, and it is possible to determine the number of these with some degree of exactness. During the same lapse of time there will be a much larger number of nerve-actions. Hence the *conscious* personality cannot represent *all* that is going on in the nerve centers: it is only an abstract, an epitome of them. This follows necessarily from the nature of our mental constitution: our states of consciousness range themselves in time, not in space, and according to one dimension, not all dimensions. By a fusion and an integration of simple states are formed highly complex states, and these enter into the series as if they were simple: they may in some measure co-exist for a little time; but after all the compass (or extension) of consciousness [Umfang des Bewusstseins], and particularly the compass of clear consciousness, is always very limited. Hence we cannot regard the conscious personality, in its relation to the objective, cerebral personality, as a tracing which corresponds exactly with the drawing from which it is copied: it rather resembles a topographical sketch as related to the face of the country it represents.

Why do some nerve-actions (and which ones?) become conscious? To answer this question would be to solve the problem of the conditions of consciousness: but these, as we have said, are in great part unknown. There has also been much discussion as to the part played in the genesis of consciousness by the five layers of the cortical cells, but on this point we have nothing save pure hypotheses. These we need not consider here, for it cannot be of any advantage to psychology to rest its conclusions upon an insecure physiological foundation. We know that states of consciousness, always unstable, evoke and supplant one another. This is the result of a transmission of force, and of a conflict among forces; and, for us, it is not a conflict between states of consciousness, as commonly supposed, but between the nervous elements which underlie and produce them. These associations and these antagonisms, which have been the object of deep study in our day, do not however belong to the present inquiry: we must go further back and consider the conditions of their organic unity. For states of consciousness are no *ignes fatui*, now flaring, anon extinguished: there is something which unites them,

* *Lectures on the Evolution and Dissolution of the Nervous System*, 1884.

and which is the subjective expression of their objective coördination: in this we find the ultimate ground of their continuity. Though we have already studied this point, it is so important that I have no hesitation about returning to it and viewing it under another aspect.

Be it remarked that we are not speaking just now of self-conscious personality, but of that spontaneous, natural sense of our own being which exists in every normal individual. Every one of my states of consciousness possesses the twofold character of being such or such a state, and of being *mine*; pain is not simply pain, but *my* pain; seeing a tree is not simply seeing it but *my* seeing it. Each one has a mark whereby it is known to me as mine only, and without which it seems foreign to me, as in some morbid cases already referred to. This mark common to all my states of consciousness is a sign of their common origin, and whence can it come if not from the organism? Suppose we were able to obliterate in a man the five special senses and with them their entire psychological product, such as perceptions, images, ideas, associations of ideas with one another and of emotions with ideas. In that case there would still remain the inward, organic life with its proper sensibility to the state and functionment of each organ, to the general or local variations of the organs, and to the elevation or the depression of the vital tone. The state of a man who is sound asleep pretty fully realizes these conditions. If now we try the opposite hypothesis, we find it absurd, contradictory. We cannot imagine to ourselves the special senses, together with the psychic life which they sustain, isolated from the general sensibility and suspended *in vacuo*. None of our sense-apparatus is an abstraction: there is no such thing as a visual or an auditive apparatus in general, as they are described in physiological treatises, but only a concrete, invididual apparatus, and never, save perhaps sometimes in twins, are these apparatus alike in two individuals. Nor is this all, for not only is the sense apparatus of each individual peculiarly constituted—a peculiarity directly and necessarily communicated to all its products—but it is at all times and in every respect dependent on the organic life—on the circulation, digestion, respiration, secretion and so forth. These several expressions of the individuality attach to every perception, emotion, idea, and become one with them, like the harmonics with the fundamental tone in music. The personal and *possessive* character of our states of consciousness therefore is not, as some authors have held, the result of a more or less explicit judgment affirming them to be mine at the instant they arise. *The personal character is not superadded, but inherent:* it is an integral part of the fact, and results from its physiologigal conditions. We do not find out the origin of a state of consciousness by observing itself alone, for it cannot be at once effect and cause, subjective state and nerve-action.

The pathological facts confirm this conclusion. As we have seen, the consciousness of selfhood rises or falls according to the state of the organism, and hence some patients declare that their "sensations are changed"—the explanation being that in their case the fundamental tone has no longer the same harmonics. So too we have seen states of consciousness lose by degrees their personal character, becoming for the individual objective and extraneous. Can such facts be accounted for on any other theory?

John Stuart Mill, in an oft-quoted passage, asks what is the bond, what the "organic union" between one state of consciousness and another—the common and lasting element; and his conclusion is that we can affirm nothing definitively of mind but states of consciousness. That is doubtless so if we confine ourselves to pure ideology. But a group of effects is not a cause, and however minutely we study these, unless we go deeper our labor is incomplete—that is, unless we descend into that obscure region where, as Taine says, "innumerable currents are ever circulating quite beyond our consciousness." The organic *nexus* desiderated by Mill exists by definition, so to speak, in the organism.

The organism and the brain, its supreme representation, is the real personality, containing in itself the reminiscence of what we have been and the possibilities of what we shall be. On it is inscribed the entire individual character with all its aptitudes, active or passive, its sympathies and antipathies, its genius and talent or its stupidity, its virtues and its vices, its sloth or its activity. What comes forth in the consciousness is little compared with what lies hid though still active. The conscious personality is only a small part of the physical personality.

Hence the unity of the Me is not, as

taught by the spiritualists,* the unity of one entity manifested in multiple phenomena, but the coördination of a number of states that are continually arising, and its one basis is the vague sense of our own bodies—cœnæsthesis. This unity does not proceed from above downward, but from beneath upward: it is not an initial but a terminal point.

Does such perfect unity exist? In the strict sense, clearly not. In the relative sense it is seen, but rarely and momentarily. In the skilled marksman as he takes aim, or in the surgeon as he is performing an operation, there is a convergence of all the faculties mental and physical. But observe the result: in such circumstances the sense of the real personality disappears, and thus we see that perfect unity of consciousness and the sense of the personality are mutually exclusive. And we may reach the same conclusion by another route. The Me is a coördination. It oscillates between two extreme points—perfect unity and absolute incoördination—else it ceases to be; and we find all the intermediate degrees exemplified without any line of demarkation between normal and abnormal, health and disease, the one trenching upon the other.†

The unity of the Me then, in the psychological sense, is the cohesion, for a given time, of a certain number of clear states of consciousness, accompanied by others less clear and by a multitude of physiological states, which, though unaccompanied by consciousness, are not less effective than the conscious states, and even more effective. Unity means coordination. The gist of the whole matter is that the *consensus* of the consciousness, being subordinate to the *consensus* of the organism, the problem of the unity of the Me is, in the last resort, a biological problem, and it is for biology to explain, if it can, the genesis of organisms and the solidarity of their parts: the psychological explanation can come only then. This we endeavored to show in detail by analyzing and discussing morbid cases. Here then our task ends.

* Opposed to *Materialists*.

† Even in the normal state the coördination is often so lax that several series co-exist separately. One may walk about, or perform manual work with a vague, intermittent consciousness of his movements, at the same time singing and musing; but as he begins to think more intently, he stops singing.

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PREFACE.

It is the genial tax of literature upon Travel that those who have explored the regions of the uncivilized should open their bag of wonders before the world and celebrate their return to clothing in three or four volumes and a map. This exaction, in the nature of things, must shortly abolish itself; and meantime I would compound with any possible creditors by the reduced offer of three or four maps and a volume.

As a minor traveller, whose assets are few, I have struggled to evade even this obligation; but having recently had to lecture on African subjects to various learned and unlearned Societies in England and America, it has been urged upon me that a few of the lecture-notes thrown into popular form might be useful as a general sketch of East Central Africa. Great books of travel have had their day. But small books, with the larger features of a country lightly sketched, and just enough of narrative to make you feel that you are really there, have a function in helping the imagination of those who have not breath enough to keep up with the great explorers.

The publication of "The White Ant" and "Mimicry" has been already forestalled by one of the monthly magazines; and the "Geological Sketch" is rescued, and duly dusted, from the archives of the British Association. If the dust of science has been too freely shaken from the other chapters, the scientific reader will overlook it for the sake of an overworked public which has infinite trouble in getting itself mildly instructed and entertained without being disheartened by the heavy pomp of technical expression.

If anything in a work of this class could pretend to a serious purpose, I do not conceal that, in addition to the mere desire to inform, a special reason exists just now for writing about Africa—a reason so urgent that I excuse myself with difficulty for introducing so grave a problem in so slight a setting. The reader who runs his eye over the "Heart-Disease of Africa" will discover how great the need is for arousing afresh that truer interest in the Dark Continent which since Livingstone's time has almost died away. To many modern travellers Africa is simply a country to be explored; to Livingstone it was a land to be pitied and redeemed. And recent events on Lake Nyassa have stirred a new desire in the hearts of those who care for native Africa that "the open sore of the world" should have a last and decisive treatment at the hands of Scotland.

HENRY DRUMMOND.

I.

THE WATER-ROUTE TO THE HEART OF AFRICA.

THE ZAMBESI AND SHIRE.

THREE distinct Africas are known to the modern world—North Africa, where men go for health; South Africa, where they go for money; and Central Africa, where they go for adventure. The first, the old Africa of Augustine and Carthage, every one knows from history; the geography of the second, the Africa of the Zulu and the diamond, has been taught us by two Universal Educators—War and the Stock-Exchange; but our knowledge of the third, the Africa of Livingstone and Stanley, is still fitly symbolized by the vacant look upon our maps which tells how long this mysterious land has kept its secret.

Into the heart of this mysterious Africa I wish to take you with me now. And let me magnify my subject by saying at once that it is a wonderful thing to see. It is a wonderful thing to start from the civilization of Europe, pass up these mighty rivers, and work your way into that unknown land — work your way alone, and on foot, mile after mile, month after month, among strange birds and beasts and plants and insects, meeting tribes which have no name, speaking tongues which no man can interpret, till you have reached its secret heart, and stood where white man has never trod before. It is a wonderful thing to look at this weird world of human beings —half animal, half children, wholly savage and wholly heathen; and to turn and come back again to civilization before the impressions have had time to fade, and while the myriad problems of so strange a spectacle are still seething in the mind. It is an education to see this sight—an education in the meaning and history of man. To have been here is to have lived before Menes. It is to have watched the dawn of evolution. It is to have the great moral and social problems of life, of anthropology, of ethnology, and even of theology, brought home to the imagination in the most new and startling light.

On the longest day of a recent summer—midwinter therefore in the tropics—I left London. A long railway run across France, Switzerland, and Italy brings one in a day or two to the Mediterranean. Crossing to Alexandria, the traveller strikes across Egypt, over the Nile, through the battlefield of Tel-el-Kebir, to the Red Sea, steams down its sweltering length to Aden, transhipps, and, after three lifetimes of deplorable humiliation in the south-west monsoons, terminates his sufferings at Zanzibar.

Zanzibar is the focus of all East African exploration. No matter where you are going in the interior, you must begin at Zanzibar. Oriental in its appearance, Mohammedan in its religion, Arabian in its morals, this cesspool of wickedness is a fit capital for the Dark Continent. But Zanzibar is Zanzibar simply because it is the only apology for a town on the whole coast. An immense outfit is required to penetrate this shopless and foodless land, and here only can the traveller make up his caravan. The ivory and slave trades have made caravaning a profession, and everything the explorer wants is to be had in these bazaars, from a tin of sardines to a repeating rifle. Here these black villains the porters, the necessity and the despair of travellers, the scum of old slave gangs, and the fugitives from justice from every tribe, congregate for hire. And if there is one thing on which African travellers are for once agreed, it is that for laziness, ugliness, stupidness, and wickedness, these men are not to be matched on any continent in the world. Their one strong point is that they will engage themselves for the Victoria Nyanza or for the Grand Lake of the Tanganyika with as little

as a Chamounix guide volunteers for the Jardin; but this singular avidity is mainly due to the fact that each man cherishes the hope of running away at the earliest opportunity. Were it only to avoid requiring to employ these gentlemen, having them for one's sole company month after month, seeing them transgress every commandment in turn before your eyes—you yourself being powerless to check them except by a wholesale breach of the sixth—it would be worth while to seek another route into the heart of Africa.

But there is a much graver objection to the Zanzibar route to the interior. Stanley started by this route on his search for Livingstone, two white men with him; he came back without them. Cameron set out by the same path to cross Africa with two companions; before he got to Tanganyika he was alone. The Geographical Society's late expedition, under Mr. Keith Johnston, started from Zanzibar with two Europeans; the hardy and accomplished leader fell within a couple of months. These expeditions have all gone into the interior by this one fatal way, and probably every second man, by fever or by accident, has left his bones to bleach along the road. Hitherto there has been no help for it. The great malarious coast-belt must be crossed, and one had simply to take his life in his hands and go through with it.

But now there is an alternative. There is a rival route into the interior, which though it is not without its dark places too, will probably yet become the great highway from the East to Central Africa. Let me briefly sketch it.

Africa, speaking generally, is a vast, ill-formed triangle. It has no peninsulas; it has almost no islands or bays or fjords. But three great inlets, three mighty rivers piercing it to the very heart, have been allocated by a kind Nature one to each of its solid sides. On the north is the river of the past, flowing through Egypt, as Leigh Hunt says, "like some grave, mighty thought threading a dream"; on the west the river of the future, the not less mysterious Congo; and on the east the little-known Zambesi.

The physical features of this great continent are easily grasped. From the coast a low scorched plain, reeking with malaria, extends inland in unbroken monotony for two or three hundred miles. This is succeeded by mountains slowly rising into a plateau some 2000 or 3000 feet high; and this, at some hundreds of miles distance, forms the pedestal for a second plateau as high again. This last plateau, 4000 to 5000 feet high, may be said to occupy the whole of Central Africa. It is only on the large scale, however, that these are to be reckoned plateaux at all. When one is upon them he sees nothing but mountains and valleys and plains of the ordinary type, covered for the most part with forest.

I have said that Nature has supplied each side of Africa with one great river. By going some hundreds of miles southward along the coast from Zanzibar the traveller reaches the mouth of the Zambesi. Livingstone sailed up this river once, and about a hundred miles from its mouth discovered another river twisting away northwards among the mountains. The great explorer was not the man to lose such a chance of penetrating the interior. He followed this river up, and after many wanderings found himself on the shores of a mighty lake. The river is named the Shiré and the lake—the existence of which was quite unknown before, is Lake Nyassa. Lake Nyassa is 350 miles long; so that, with the Zambesi, the Shiré, and this great lake, we have the one thing required to open up East Central Africa—a water-route to the interior. But this is not all. Two hundred and fifty miles from the end of Lake Nyassa another lake of still nobler proportions takes up the thread of communication. Lake Tanganyika

is 450 miles in length. Between the lakes stands a lofty plateau, cool, healthy, accessible, and without any physical barrier to interrupt the explorer's march. By this route the Victoria Nyanza and the Albert Nyanza may be approached with less fatigue, less risk, and not less speed, than by the overland trail from Zanzibar. At one point also, along this line, one is within a short march of that other great route which must ever be regarded as the trunk-line of the African continent. The watershed of the *Congo* lies on this Nyassa-Tanganyika plateau. This is the stupendous natural highway on which so much of the future of East Central Africa must yet depend.

Ten days languid steaming from Zanzibar brings the traveller to the Zambesi mouth. The bar here has an evil reputation, and the port is fixed on a little river which flows into the Indian Ocean slightly to the north, but the upper reaches of which almost join the Zambesi at some distance inland. This port is the Portuguese settlement of Quilimane, and here I said good-bye to the steamer and to civilization. Some distance in the interior stands a solitary pioneer Mission station of the Established Church of Scotland, and still farther in, on Lake Nyassa, another outpost of a sister church. My route led past both these stations, and I had the good fortune to pick up on the way two or three young fellow-countrymen who were going up to relieve the mission staff. For the latter part of my journey I was quite alone. All African work, as a rule, is done single-handed. It is not always easy to find a companion for such a project, and the climate is so pestilential that when two go, you and your friend are simply nursing each other time about, and the expedition never gets on. On the whole, however, the solitary course is not to be commended. An unutterable loneliness comes over one at times in the great still forests, and there is a stage in African fever—and every one *must* have fever—when the watchful hand of a friend may make the difference between life and death.

After leaving Quilimane, the first week of our journey up the Qua-qua was one long picnic. We had two small row-boats, the sterns covered with a sun-proof awning, and under these we basked, and talked, and read and prospected, from dawn to sunset. Each boat was paddled by seven or eight natives—muscular heathens, whose sole dress was a pocket-handkerchief, a little palm oil, and a few mosquitoes. Except at first the river was only a few yards broad, and changed in character and novelty every hour. Now it ran through a grove of cocoa-nut palms—the most wonderful and beautiful tree of the tropics. Now its sullen current oozed through a fœtid swamp of mangroves—the home of the crocodile and the hippopotamus, whose slimy bodies wallowed into the pools with a splash as our boats sped past. Again the banks became green and graceful, the long plumed grasses bending to the stream, and the whole a living aviary of birds—the white ibis and the gaunt fish eagle, and the exquisite blue and scarlet kingfisher watching its prey from the overhanging boughs. The business-like air of this last bird is almost comical, and somehow sets ill on a creature of such gorgeous beauty. One expects him to flutter away before the approach of so material a thing as a boat, display his fairy plumage in a few airy movements, and melt away in the sunshine. But there he sits, stolid and impassive, and though the spray of the paddles almost dashes in his face, the intent eyes never move, and he refuses to acknowledge the intruder by so much as a glance. His larger ally, the black and white spotted kingfisher, if less beautiful, is much more energetic, and darts about the bank incessantly, coquetting with the boat from reach to reach, and

seldom allowing an inspection close enough to take in the details of his piebald coat.

One interests oneself in these things more particularly because there is nothing at first especially striking about the river scenery itself. Ten or twenty feet of bank cuts off the view on either side, and large and varied features are wanting. The banks are lined with the densest jungle of mangroves and aquatic grasses, while creepers of a hundred kinds struggle for life among the interlacing stems. We saw crocodiles here in such numbers that count was very soon lost. They were of all sizes, from the baby specimen which one might take home in a bottle, to the enormous bullet-proof brute the size of an 81-ton gun. These revolting animals take their siesta in the heat of the day, lying prone upon the bank, with their wedge-shaped heads directed towards the water. When disturbed they scuttle into the river with a wriggling movement, the precipitancy of which defies the power of sight. The adjustment of the adult crocodile to its environment in the matter of color is quite remarkable. The younger forms are lighter yellow, and more easily discoverable, but it takes the careful use of a good pair of eyes to distinguish in the gnarled slime-covered log lying among the rotting stumps the living form of the mature specimen. Between the African crocodiles and the alligators there is the slightest possible external difference; although the longer head, the arrangement of scales, the fringed feet with their webbed toes, the uniform teeth, and the protrusion of the large canine, distinguish them from their American allies.

Many of the ibises I shot as we moved along, for food for the men, who, like all Africans, will do anything for flesh in whatever form. For ourselves, we lived upon emaciated fowls and tinned meats, cooking them at a fire on the bank when the boat stopped. Eggs are never eaten by the natives, but always set; although, if you offer to buy them, the natives will bring you a dozen from a sitting hen, which they assure you were laid that very morning. In the interior, on many occasions afterwards, these protestations were tested, and always proved false. One time, when nearly famished and far from camp, I was brought a few eggs which a chief himself guaranteed had that very hour been laid. With sincere hope that he might be right, but with much misgiving, I ordered the two freshest-looking to be boiled. With the despair of a starving man I opened them. They were cock and hen.

Breakfast and luncheon and dinner are all the same in Africa. There is no beef, nor mutton, nor bread, nor flour, nor sugar, nor salt, nor anything whatever, except an occasional fowl, which an Englishman can eat. Hence the enormous outfit which he must carry with him. No one has any idea of what can be had in tins till he camps out abroad. Every conceivable digestible and indigestible is to be had tinned, every form of fish, flesh, fowl, and game, every species of vegetable and fruit, every soup, sweet, and *entree;* but after two or three months of this sort of thing you learn that this tempting semblance of variety is a gigantic imposition. The sole difference between these various articles lies, like the Rhine wines, in the label. Plum pudding or kippered herring taste just the same. Whether you begin dinner with tinned calves-foot jelly or end with tinned salmon makes no difference; and after six months it is only by a slight feeling of hardness that you do not swallow the tins themselves.

At the end of a too short week we left our boats behind. Engaging an army of shy natives at a few huts near the bank, we struck across a low neck of land, and after an hour's

walk found ourselves suddenly on the banks of the Zambesi. A solitary bungalow was in sight, and opposite it the little steamer of the African Lakes Company, which was to take us up the Shiré. There is more in the association, perhaps, than in the landscape, to strike one as he first furrows the waters of this virgin river. We are fifty miles from its mouth, the mile-wide water shallow and brown, the low sandy banks fringed with alligators and wild birds. The great deltoid plain, yellow with sun-tanned reeds and sparsely covered with trees, stretches on every side; the sun is blistering hot; the sky, as it will be for months, a monotonous dome of blue —not a frank bright blue like the Canadian sky, but a veiled blue, a suspicious and malarious blue, partly due to the perpetual heat haze and partly to the imagination, for the Zambesi is no friend to the European, and this whole region is heavy with depressing memories.

This impression, perhaps, was heightened by the fact that we were to spend that night within a few yards of the place where Mrs. Livingstone died. Late in the afternoon we reached the spot—a low ruined hut a hundred yards from the river's bank, with a broad verandah shading its crumbling walls. A grass-grown path straggled to the doorway, and the fresh print of a hippopotamus told how neglected the spot is now. Pushing the door open, we found ourselves in a long dark room, its mud floor broken into fragments, and remains of native fires betraying its latest occupants. Turning to the right, we entered a smaller chamber, the walls bare and stained, with two glassless windows facing the river. The evening sun, setting over the far-off Morumballa mountains, filled the room with its soft glow, and took our thoughts back to that Sunday evening twenty years ago, when in this same bedroom, at this same hour, Livingstone knelt over his dying wife, and witnessed the great sunset of his life.

Under a huge baobab tree—a miracle of vegetable vitality and luxuriance—stands Mrs. Livingstone's grave. The picture in Livingstone's book represents the place as well kept and surrounded with neatly-planted trees. But now it is an utter wilderness, matted with jungle grass and trodden by the beasts of the forest; and as I looked at the forsaken mound and contrasted it with her husband's tomb in Westminster Abbey, I thought perhaps the woman's love which brought her to a spot like this might be not less worthy of immortality.

The Zambesi is the great river of Eastern Africa, and after the Congo, the Nile, and the Niger, the most important on the continent. Rising in the far interior among the marshes of Lake Dilolo, and gathering volume from the streams which flow from the high lands connecting the north of Lake Nyassa with Inner Angola, it curves across the country for over a thousand miles like an attenuated letter S, and before its four great mouths empty the far-travelled waters into the Indian Ocean, drains an area of more than half a million square miles. As it cuts its way down the successive steps of the central plateaux its usually placid current is interrupted by rapids, narrows, cascades, and cataracts, corresponding to the plateau edges, so that like all the rivers of Africa it is only navigable in stretches of one or two hundred miles at a time. From the coast the Zambesi might be stemmed by steam-power to the rapids of Kebrabasa; and from above that point intermittently, as far as the impassable barrier of the Victoria Falls. Above this, for some distance, again follow rapids and waterfalls, but these are at length succeeded by an unbroken chain of tributaries which together form an inland waterway of a thousand miles in length. The broad lands along the banks of this noble river are sub-

ject to annual inundations like the region of the Nile, and hence their agricultural possibilities are unlimited. On the lower Zambesi, indigo, the orchilla weed, and calumba-root abound, and oil-seeds and sugar-cane could be produced in quantity to supply the whole of Europe. At present owing to apathy and indifferent government these magnificent resources are almost wholly undeveloped.

Next afternoon our little vessel left the Zambesi in its wake and struck up a fine lake-like expansion to the north, which represents the mouth of the Shiré. Narrower and deeper, the tributary is a better stream for navigation than the Zambesi. The scenery also is really fine especially as one nears the mountains of the plateau, and the strange peoples and animals along the banks occupy the mind with perpetual interests. The hippopotami prowling round the boat and tromboning at us within pistol-shot kept us awake at night; and during the day we could see elephants, buffaloes, deer, and other large game wandering about the banks. To see the elephant at home is a sight to remember. The stupendous awkwardness of the menagerie animal, as if so large a creature were quite a mistake, vanishes completely when you watch him in his native haunts. Here he is as nimble as a kitten, and you see how perfectly this moving mountain is adapted to its habitat—how such a ponderous monster, indeed, is as natural to these colossal grasses as a rabbit to an English park. We were extremely fortunate in seeing elephants at all at this stage, and I question whether there is any other part of Africa where these animals may be observed leisurely and in safety within six weeks of London. Mr. Stanley in his Livingstone expedition was ten months in the country before he saw any; and Mr. Joseph Thomson, during his long journey to Tanganyika and back, never came across a single elephant. It is said that the whale which all travellers see in crossing the Atlantic is kept up by the steamboat companies, but I vouch that these Shiré valley elephants are independent of subsidy.

The question of the disappearance of the elephant here and throughout Africa is, as every one knows, only one of a few years. It is hard to think why this kindly and sagacious creature should have to be exterminated; why this vast store of animal energy, which might be turned into so much useful work, should be lost to civilization. But the causes are not difficult to understand. The African elephant has never been successfully tamed, and therefore a failure as a source of energy, As a source of ivory, on the other hand, he has been but too great a success. The cost of ivory at present is about half-a-sovereign per pound. An average tusk weighs from twenty to thirty pounds. Each animal has two, and in Africa both male and female carry tusks. The average elephant is therefore worth in pounds sterling the weight in pounds avoirdupois of one of his tusks. I have frequently seen single tusks turning the scale upon ninety pounds, the pair in this case bring worth nearly £100 sterling,—so that a herd of elephants is about as valuable as a gold mine. The temptation to sacrifice the animal for his tusks is therefore great; and as he becomes scarcer he will be pursued by the hunter with ever-increasing eagerness. But the truth is, sad though the confession be, the sooner the last elephant falls before the hunter's bullet the better for Africa. Ivory introduces into the country at present an abnormal state of things. Upon this one article is set so enormous a premium that none other among African products secures the slightest general attention; nor will almost anyone in the interior condescend to touch the normal wealth, or develop the legitimate industries of

the country, so long as a tusk remains. In addition to this, of half the real woes which now exist in Africa ivory is at the bottom. It is not only that wherever there is an article to which a fictitious value is attached the effect upon the producer is apt to be injurious; nor that wherever there is money there is temptation, covetousness, and war; but that unprincipled men, and especially Arabs, are brought into contact with the natives in the worst relation, influence them only in one and that the lowest direction, and leave them always worse than they find them—worse in greed, in knavery, in their belief in mankind, and in their suspicion of civilization. Further, for every tusk an Arab trader purchases he must buy, borrow, or steal a slave to carry it to the coast. Domestic slavery is bad enough, but now begins the long slave-march with its untold horrors—horrors instigated and perpetuated almost solely by the traffic in ivory. The extermination of the elephant, therefore, will mark one stage at least in the closing up of the slave-trade. The elephant has done much for Africa. The best he can do now for his country is to disappear forever.

In books of travel great chiefs are usually called kings, their wives queens, while their mud-huts are always palaces. But after seeing my first African chief at home, I found I must either change my views of kings or of authors. The regal splendor of Chipitula's court —and Chipitula was a very great chief indeed, and owned all the Shiré district—may be judged of by the fact that when I paid my respects to his highness his court-dress consisted almost exclusively of a pair of suspenders. I made this king happy for life by the gift of a scarlet tennis-cap and a few buttons. But poor Chipitula had not long to enjoy his treasures,—and I mention the incident to show what is going on every day in Africa. When I came back that way, on my return journey, I called again to receive a leopard skin which this chief had promised to trap for me, and for which he was to get in exchange certain dilapidated remnants of my wardrobe. He gave me the skin; I duly covered his, and we parted. A few days after, another white man came that way; he was a trader—the only one who has yet plied this hazardous calling in East Central Africa. He quarrelled with Chipitula over some bargain, and in a moment of passion drew his revolver and shot the chief dead on the spot. Of course he himself was instantly speared by Chipitula's men: and all his black porters, according to native etiquette, were butchered with their master. There is absolutely no law in Africa, and you can kill anybody and anybody can kill you, and no one will ask any questions.

Our next stoppage was to pay another homage—truly this is a tragic region—at another white man's grave. A few years ago Bishop Mackenzie and some other missionaries were sent to Africa by the English Universities, with instructions to try to establish a Mission in the footsteps of Livingstone. They came here; the climate overpowered them; one by one they sickened and died. With the death of the Bishop himself the site was abandoned, and the few survivors returned home. Among the hippopotamus-trampled reeds on the banks of the Shiré, under a rough iron cross, lies the first of three brave bishops who have already made their graves in Equatorial Africa.

I have spoken of the Shiré as the great waterway into the interior of Eastern Africa. It has one defect. After sailing for five or six days we came to rapids which no boat can pass. These rapids were named by Livingstone the Murchison Cataracts, and they extend for seventy miles. This distance, accordingly, must be traversed overland. Half-way up

this seventy miles, and a considerable distance inland from the river, stands the first white settlement in East Central Africa—the Blantyre Mission. Bribing about a hundred natives with a promise of a fathom of calico each, to carry our luggage, we set off on foot for Blantyre. The traditional characteristics of African caravaning were displayed in full perfection during this first experience, and darkness fell when we were but half-way to our destination. It was our first night in the bush, and a somewhat unusual introduction to African travelling marked it. At midnight we were roused by startling cries from our men, who lay sleeping on the ground around us. The watch-fires must have burned down, for a lion had suddenly sprung into the camp. Seizing the man who lay nearest the forest the animal buried its claws in his breast, and was making off into the darkness, when the shouting frightened it and made it drop its prey. Twice during the night the lion came back, and we whites had to keep watch by turns till morning with loaded rifles. This is altogether an exceptional case, for with a good fire one can generally spread his mat anywhere in the tropics without fear of midnight attack. This is a famous place, however, for lions, and one can as certainly depend on their gruesome concert in the early morning as on the sparrows' chirp in England.

Towards sunset the following evening our caravan filed into Blantyre. On the beauty and interest of this ideal mission I shall not dwell. But if any one wishes to find out what can be done with the virgin African, what can be done by broad and practical missionary methods, let him visit the Rev. D. Clement Scott and his friends at Blantyre. And if he wishes to observe the possibilities of civilization and colonization among an average African tribe living on an average African soil, let him examine the mission plantations, and those of Mr. John and Mr. Frederick Moir at Mandala, and of the Brothers Buchanan at Zomba. And, further, if he desires to know what the milk of human kindness is, let him time his attack of fever so that haply it may coincide with his visit to either of these centres of self-denying goodness and hospitality.

II.

THE EAST AFRICAN LAKE COUNTRY.

LAKES SHIRWA AND NYASSA.

Somewhere in the Shiré Highlands, in 1859, Livingstone saw a large lake—Lake Shirwa—which is still almost unknown. It lies away to the East, and is bounded by a range of mountains whose lofty summits are visible from the hills round Blantyre. Thinking it might be useful initiation to African travel if I devoted a short time to its exploration, I set off one morning accompanied by two members of the Blantyre staff and a small retinue of natives. Steering across country in the direction in which it lay, we found, two days before seeing the actual water, that we were already on the ancient bed of the lake. Though now clothed with forest, the whole district has obviously been under water at a comparatively recent period, and the shores of Lake Shirwa probably reached at one time to within a few miles of Blantyre itself. On reaching the lake a very aged female chief came to see us, and told us how, long long ago, a white man came to her village and gave her a present of cloth. Of the white man, who must have been Livingstone, she spoke very kindly ; and indeed, wherever David Livingstone's footsteps are

crossed in Africa the fragrance of his memory seems to remain.

The waters of Shirwa are brackish to the taste, and undrinkable; but the saltness must have a peculiar charm for game, for nowhere else in Africa did I see such splendid herds of the larger animals as here. The zebra was especially abundant; and so unaccustomed to be disturbed are these creatures, that with a little care one could watch their movements safely within a very few yards. It may seem unorthodox to say so, but I do not know if among the larger animals there is anything handsomer in creation than the zebra. At close quarters his striped coat is all but as fine as the tiger's, while the form and movement of his body are in every way nobler. The gait, certainly, is not to be compared for gracefulness with that of the many species of antelope and deer who nibble the grass beside him, and one can never quite forget that scientifically he is an ass; but taking him all in all, in this fleet and beautiful animal ought to have a higher place in the regard of man than he has yet received.

We were much surprised, considering that this region is almost uninhabited, to discover near the lake shore a native path so beaten, and so recently beaten, by multitudes of human feet, that it could only represent some trunk route through the continent. Following it for a few miles, we soon discovered its function. It was one of the great slave routes through Africa. Signs of the horrid traffic soon became visible on every side; and from symmetrical arrangements of small piles of stones and freshly-cut twigs, planted semaphore-wise upon the path, our native guides made out that a slave-caravan was actually passing at the time. We were, in fact, between two portions of it, the stones and twigs being telegraphic signals between front and rear. Our natives seemed much alarmed at this discovery, and refused to proceed unless we promised not to interfere—a proceeding which, had we attempted it, would simply have meant murder for ourselves and slavery for them. Next day, from a hill-top, we saw the slave encampment far below, and the ghastly procession marshalling for its march to the distant coast, which many of the hundreds who composed it would never reach alive.

Talking of native footpaths leads me to turn aside for a moment to explain to the uninitiated the true mode of African travel. In spite of all the books that have been lavished upon us by our great explorers, few people seem to have any accurate understanding of this most simple process. Some have the impression that everything is done in bullock-wagons—an idea borrowed from the Cape, but hopelessly inapplicable to Central Africa, where a wheel at present would be as great a novelty as a polar bear. Others at the opposite extreme suppose that the explorer works along solely by compass, making a bee-line for his destination, and steering his caravan through the trackless wilderness like a ship at sea. Now it may be a surprise to the unenlightened to learn that probably no explorer in forcing his passage through Africa has ever, for more than a few days at a time, been off some beaten track. Probably no country in the world, civilized or uncivilized, is better supplied with paths than this unmapped continent. Every village is connected with some other village, every tribe with the next tribe, every state with its neighbor, and therefore with all the rest. The explorer's business is simply to select from this network of tracks, keep a general direction, and hold on his way. Let him begin at Zanzibar, plant his foot on a native footpath, and set his face towards Tanganyika. In eight months he will be there. He has simply to persevere. From village

to village he will be handed on, zigzagging it may be sometimes to avoid the impassable barriers of nature or the rarer perils of hostile tribes, but never taking to the woods, never guided solely by the stars, never in fact leaving a beaten track, till hundreds and hundreds of miles are between him and the sea, and his interminable footpath ends with a canoe, on the shores of Tanganyika. Crossing the lake, landing near some native village, he picks up the thread once more. Again he plods on and on, now on foot, now by canoe, but always keeping his line of villages, until one day suddenly he sniffs the sea-breeze again, and his faithful foot-wide guide lands him on the Atlantic seaboard.

Nor is there any art in finding out these successive villages with their intercommunicating links. He *must* find them out. A whole army of guides, servants, carriers, soldiers, and camp-followers accompany him in his march, and this nondescript regiment must be fed. Indian corn, cassava, mawere, beans and bananas—these do not grow wild even in Africa. Every meal has to be bought and paid for in cloth and beads ; and scarcely three days can pass without a call having to be made at some village where the necessary supplies can be obtained. A caravan, as a rule, must live from hand to mouth, and its march becomes simply a regulated procession through a chain of markets. Not, however, that there are any real markets—there are neither bazaars nor stores in native Africa. Thousands of the villages through which the traveller eats his way may never have victualled a caravan before. But, with the chief's consent, which is usually easily purchased for a showy present, the villages unlock their larders, the women flock to the grinding stones, and basketfuls of food are swiftly exchanged for unknown equivalents in beads and calico.

The native tracks which I have just described are the same in character all over Africa. They are veritable footpaths, never over a foot in breadth, beaten as hard as adamant, and rutted beneath the level of the forest bed by centuries of native traffic. As a rule these footpaths are marvellously direct. Like the roads of the old Romans, they run straight on through everything, ridge and mountain and valley, never shying at obstacles, nor anywhere turning aside to breathe. Yet within this general straightforwardness there is a singular eccentricity and indirectness in detail. Although the African footpath is on the whole a bee-line, no fifty yards of it are ever straight. And the reason is not far to seek. If a stone is encountered no native will ever think of removing it. Why should he? It is easier to walk round it. The next man who comes that way will do the same. He knows that a hundred men are following him ; he looks at the stone ; a moment, and it might be unearthed and tossed aside, but no ; he also holds on his way. It is not that he resents the trouble, it is the idea that is wanting. It would no more occur to him that that stone was a displaceable object, and that for the general weal he might displace it, than that its feldspar was of the orthoclase variety. Generations and generations of men have passed that stone, and it still waits for a man with an altruistic idea. But it would be a very stony country indeed—and Africa is far from stony —that would wholly account for the aggravating obliqueness and indecision of the African footpath. Probably each four miles, on an average path, is spun out by an infinite series of minor sinuosities, to five or six. Now these deflections are not meaningless. Each has some history—a history dating back perhaps a thousand years, but to which all clue has centuries ago been lost. The leading cause probably is fallen trees. When a tree

falls across a path no man ever removes it. As in the case of the stone, the native goes round it. It is too green to burn in his hut; before it is dry, and the white ants have eaten it, the new detour has become part and parcel of the path. The smaller irregularities, on the other hand, represent the trees and stumps of the primeval forest where the track was made at first. But whatever the cause, it is certain that for persistent straightforwardness in the general, and utter vacillation and irresolution in the particular, the African roads are unique in engineering.

Though one of the smaller African lakes, Shirwa is probably larger than all the lakes of Great Britain put together. With the splendid environment of mountains on three of its sides, softened and distanced by perpetual summer haze, it reminds one somewhat of the Great Salt Lake simmering in a July sun. We pitched our tent for a day or two on its western shore among a harmless and surprised people who had never gazed on the pallid countenances of Englishmen before. Owing to the ravages of the slaver the people of Shirwa are few, scattered and poor, and live in abiding terror. The densest population is to be found on the small island, heavily timbered with baobabs, which forms a picturesque feature of the northern end. These Wa-Nyassa, or people of the lake, as they call themselves, have been driven here by fear, and they rarely leave their Lake Dwelling unless under cover of night. Even then they are liable to capture by any man of a stronger tribe who happens to meet them, and numbers who have been kidnapped in this way are to be found in the villages of neighboring chiefs. This is an amenity of existence in Africa that strikes one as very terrible. It is impossible for those at home to understand how literally savage man is a chattel, and how much his life is spent in the mere safeguarding of his main asset, *i. e.* himself. There are actually districts in Africa where *three* natives cannot be sent a message in case two should combine and sell the third before they return.

After some time spent in the Lake Shirwa and Shiré districts, I set out for the Upper Shiré and Lake Nyassa. Two short days' walk from the settlement at Blantyre brings one once more to the banks of the Shiré. Here I found waiting the famous little *Ilala*, a tiny steamer, little bigger than a large steam launch. It belonged originally to the missionaries on Lake Nyassa, and was carried here a few years ago from England in seven hundred pieces, and bolted together on the river bank. No chapter in romance is more interesting than the story of the pioneer voyage of the *Ilala*, as it sailed away for the first time towards the unknown waters of Nyassa. No keel had ever broken the surface of this mighty lake before, and the wonderment of the natives as the Big Canoe hissed past their villages is described by those who witnessed it as a spectacle of indescribable interest. The *Ilala* is named, of course, after the village where David Livingstone breathed his last. It indicates the heroic mission of the little ship—to take up the work of Civilization and Christianity where the great explorer left it. The *Ilala* now plies at intervals between the Upper Shiré—above the cataracts—and the shores of Lake Nyassa, carrying supplies to the handful of missionaries settled on the western shore. Though commanded by a white man, the work on board is entirely done by natives from the locality. The confidence of the black people once gained, no great difficulty seems to have been found in getting volunteers enough for this novel employment. Singularly enough, while deck hands are often only enlisted after some persuasion, the competition for the office of fireman—a dis-

agreeable post at any time, but in the tropical heat the last to be coveted—is so keen that any number of natives are at all times ready to be frizzled in the stokehole. Instead of avoiding heat, the African native everywhere courts it. His nature expands and revels in it; while a breath of cold on a mountain slope, or a sudden shower of rain, transforms him instantly into a most woebegone object.

After leaving Matope, just above the Murchison cataracts, the *Ilala* steams for a couple of days in the river before Lake Nyassa is reached. The valley throughout this length is very broad, bounded on either side by distant mountains which at an earlier period probably formed the shores of a larger Lake Nyassa. The fact that Lake Nyassa is silting up at its southern end becomes more apparent as one nears the lake, for here one finds a considerable expanse already cut off from the larger portion, and forming a separate sheet of water. The smaller lake is Lake Pomalombe, and it is already so shallow that in the dry season the *Ilala's* screw stirs the gray mud at the bottom. The friendship of the few villages along the bank is secured by an occasional present; although the relations between some of them and the Big Canoe are at times a little strained, and in bad humors doubtless they would send it to the bottom if they dared. It is to be remembered that this whole region is as yet altogether beyond the limits, and almost beyond the knowledge, of civilization, and few white men have ever been in the country, except the few agents connected with the Lakes Company and the Missions. Beyond an occasional barter of cloth or beads for firewood and food, the *Ilala* has no dealings with the tribes on the Upper Shiré, and at present they are about as much affected by the passing to and fro of the white man's steamer as are the inhabitants of Kensington by an occasional wild-fowl making for Regent's Park. One is apt to conclude, from the mere presence of such a thing as a steamer in Central Africa, that the country through which it is passing must be in some sense civilized, and the hourly reminders to the contrary which one receives on the spot are among the most startling experiences of the traveller. It is almost impossible for him to believe, as he watches the native life from the cabin of the *Ilala*, that these people are altogether uncivilized; just as it is impossible for him to believe that that lurch a moment ago was caused by the little craft bumping against a submerged hippopotamus. A steel ship, London built, steaming six knots ahead; and grass huts, nude natives, and a hippopotamus—the ideas refuse to assort themselves, and one lives in a perpetual state of bewilderment and interrogation.

It was a brilliant summer morning when the *Ilala* steamed into Lake Nyassa, and in a few hours we were at anchor in the little bay at Livingstonia. My first impressions of this famous mission-station certainly will never be forgotten. Magnificent mountains of granite, green to the summit with forest, encircled it, and on the silver sand of a still smaller bay stood the small row of trim white cottages. A neat path through a small garden led up to the settlement, and I approached the largest house and entered. It was the Livingstonia manse—the head missionary's house. It was spotlessly clean; English furniture was in the room, a medicine chest, familiar-looking dishes were in the cupboards, books lying about, but there was no missionary in it. I went to the next house—it was the school, the benches were there and the blackboard, but there were no scholars and no teacher. I passed to the next, it was the blacksmith's shop; there were the tools and the anvil, but there was no blacksmith. And so on to the next, and the next, all in prefect order, and all *empty*.

Then a native approached and led me a few yards into the forest, And there among the mimosa trees. under a huge granite mountain, were four or five graves. These were the missionaries.

I spent a day or two in the solemn shadow of that deserted manse. It is one of the loveliest spots in the world ; and it was hard to believe, sitting under the tamarind trees by the quiet lake shore, that the pestilence which wasteth at midnight had made this beautiful spot its home. A hundred and fifty miles north, on the same lake-coast, the remnant of the missionaries have begun their task again, and there, slowly, against fearful odds, they are carrying on their work. Travellers have been pleased to say unkind things of missionaries. That they are sometimes right, I will not question. But I will say of the Livingstonia missionaries, and of the Blantyre missionaries, and count it an honor to say it, that they are brave, efficient, single-hearted men, who need our sympathy more than we know, and are equally above our criticism and our praise.

Malarial fever is the one sad certainty which every African traveller must face. For months he may escape, but its finger is upon him, and well for him if he has a friend near when it finally overtakes him. It is preceded for weeks, or even for a month or two, by unaccountable irritability, depression, and weariness. On the march with his men he has scarcely started when he sighs for the noon-day rest. Putting it down to mere laziness, he goads himself on by draughts from the water-bottle, and totters forward a mile or two more. Next he finds himself skulking into the forest on the pretext of looking at a specimen, and, when his porters are out of sight, throws himself under a tree in utter limpness and despair. Roused by mere shame, he staggers along the trail, and as he nears the mid-day camp puts on a spurt to conceal his defeat, which finishes him for the rest of the day. This is a good place for specimens he tells the men — the tent may be pitched for the night. This goes on day after day till the crash comes —first cold and pain, then heat and pain, then every kind of pain, and every degree of heat, then delirium, then the life-and-death struggle. He rises, if he does rise, a shadow ; and slowly accumulates strength for the next attack, which he knows too well will not disappoint him. No one has ever yet got to the bottom of African fever. Its geographical distribution is still unmapped, but generally it prevails over the whole east and west coasts within the tropical limit, along all the river-courses, on the shores of the inland lakes, and in all low-lying and marshy districts. The higher plateaux, presumably, are comparatively free from it, but in order to reach these, malarious districts of greater or smaller area have to be traversed. There the system becomes saturated with fever, which often develops long after the infected region is left behind. The known facts with regard to African fever are these : First, it is connected in some way with drying-up water and decaying vegetation, though how the germs develop, or what they are, is unknown. Second, natives suffer from fever equally with Europeans, and this more particularly in changing from district to district and from altitude to altitude. Thus, in marching over the Tanganyika plateau, four or five of my native carriers were down with fever, although their homes were only two or three hundred miles off, before I had even a touch of it. Third, quinine is the great and almost the sole remedy ; and fourth, no European ever escapes it.

The really appalling mortality of Europeans is a fact with which all who have any idea of casting in their lot with Africa should serious-

ly reckon. None but those who have been on the spot, or have followed closely the inner history of African exploration and missionary work, can appreciate the gravity of the situation. The malaria spares no man; the strong fall as the weak; no number of precautions can provide against it; no kind of care can do more than make the attacks less frequent; no prediction can be made beforehand as to which regions are haunted by it and which are safe. It is not the least ghastly feature of this invisible plague that the only known scientific test for it at present is a human life. That test has been applied in the Congo region already with a recklessness which the sober judgment can only characterize as criminal. It is a small matter that men should throw away their lives, in hundreds if need be, for a holy cause; but it is not a small matter that man after man, in long and in fatal succession, should seek to overleap what is plainly a barrier of Nature. And science has a duty in pointing out that no devotion or enthusiasm can give any man a charmed life, and that those who work for the highest ends will best attain them in humble obedience to the common laws. Transcendentally, this may be denied; the warning finger may be despised as the hand of the coward and the profane. But the fact remains—the fact of an awful chain of English graves stretching across Africa. This is not spoken, nevertheless, to discourage missionary enterprise. It is only said to regulate it.

To the head of Lake Nyassa in a little steam yacht is quite a sea-voyage. What with heavy seas, and head-winds, and stopping to wood, and lying-to at nights, it takes longer time than going from England to America. The lake is begirt with mountains, and storms are so incessant and so furious that Livingstone actually christened Nyassa the "Lake of Storms." The motion on anchoring at night was generally so unpleasant that one preferred then to be set on shore. My men—for I had already begun to pick up my caravan wherever I could find a native willing to go—would kindle fires all round to keep off beasts of prey, and we slept in peace upon the soft lake sand.

Instead of being one hundred and fifty miles long, as first supposed, Lake Nyassa is now known to have a length of three hundred and fifty miles, and a breadth varying from sixteen to sixty miles. It occupies a gigantic trough of granite and gneiss, the profoundly deep water standing at a level of sixteen hundred feet above the sea, with the mountains rising all around it, and sometimes sheer above it, to a height of one, two, three, and four thousand feet. The mountains along the west coast form an almost unbroken chain, while the north-east and north are enclosed by the vast range of the Livingstone Mountains. The anchorages on the lake are neither so numerous nor so sheltered as might be wished, but the *Ilala* has picked out some fair harbors on the west coast, and about half as many are already known on the east.

I only visited one native village on the lake, and I should hope there are none others like it—indeed it was quite exceptional for Africa. I tumbled into it early one morning, out of the *Ilala's* dingy, and lost myself at once in an endless labyrinth of reeking huts. Its filth was indescribable, and I met stricken men, at the acute stage of small-pox, wandering about the place at every turn, as if infection were a thing unknown. The chief is the greatest slaver and the worst villain on the lake, and impaled upon poles all round his lodge, their ghastly faces shrivelling in the sun, I counted forty human heads.

This village was not African, however. It was Arab. The

native villages on Nyassa are rarely so large, seldom so compact, and never so dirty. Everywhere they straggle along the shore and through the forest, and altogether there must be many hundreds of them scattered about the lake. On the western shore alone there are at least fifteen different tribes, speaking as many different languages, and each of them with dialects innumerable.

The bright spot on Lake Nyassa is Bandawé, the present headquarters of the Scotch Livingstonia Mission. The phrase "headquarters of a mission" suggests to the home Christian a street and a square, with its overshadowing church; a decent graveyard; and a reverent community in its Sunday clothes. But Bandawé is only a lodge or two in a vast wilderness, and the swarthy worshippers flock to the seatless chapel on M'lunga's day dressed mostly in bows and arrows. The said chapel, nevertheless, is as great an achievement in its way as Cologne Cathedral, and its worshippers are quite as much interested, and some of them at least to quite as much purpose. In reality no words can be a fit witness here to the impression made by Dr. Laws, Mrs. Laws, and their few helpers, upon this singular and apparently intractable material. A visit to Bandawé is a great moral lesson. And I cherish no more sacred memory of my life than that of a communion service in the little Bandawé chapel, when the sacramental cup was handed to me by the bare black arm of a native communicant—a communicant whose life, tested afterwards in many an hour of trial with me on the Tanganyika plateau, gave him perhaps a better right to be there than any of us.

III.

THE HEART OF AFRICA.

THE COUNTRY AND ITS PEOPLE.

We are now far enough into the interior to form some general idea of the aspect of the heart of Africa. I shall not attempt to picture any particular spot. The description about to be given applies generally to Shirwa, the Shiré Highlands, Nyassa, and the Nyassa-Tanganyika plateau—regions which together make up one of the great lobes of the heart of Africa.

Nothing could more wildly misrepresent the reality than the idea of one's school days that the heart of Africa is a desert. Africa rises from its three environing oceans in three great tiers, and the general physical geography of these has been already sketched—first, a coast-line, low and deadly; farther in, a plateau the height of the Scottish Grampians; farther in still, a higher plateau, covering the country for thousands of miles with mountain and valley. Now fill in this sketch, and you have Africa before you. Cover the coast belt with rank yellow grass, dot here and there a palm; scatter through it a few demoralized villages; and stock it with the leopard, the hyena, the crocodile, and the hippopotamus. Clothe the mountainous plateaux next—both of them—with endless forest,—not grand umbrageous forest like the forests of South America, nor matted jungle like the forests of India, but with thin, rather weak forest,—with forest of low trees, whose halfgrown trunks and scanty leaves offer no shade from the tropical sun. Nor is there anything in these trees to the casual eye to remind you that you are in the tropics. Here and there one comes upon a borassus or fan-palm, a candelabra-like euphorbia, a mimosa aflame with color, or a sepulchral baobab. A close inspection also will discover curious creepers and climbers; and among the branches strange orchids hide their eccentric flowers. But the outward type of tree is the same as we have at home—trees resembling the ash, the beech and the elm, only seldom

so large, except by the streams, and never so beautiful.* Day after day you may wander through these forests with nothing except the climate to remind you where you are. The beasts, to be sure, are different, but unless you watch for them you will seldom see any; the birds are different, but you rarely hear them; and as for the rocks, they are our own familiar gneisses and granites, with honest basalt-dykes boring through them, and leopard-skin lichens staining their weathered sides. Thousands and thousands of miles, then, of vast thin forest, shadeless, trackless, voiceless—forest in mountain and forest in plain—this is East Central Africa.

The indiscriminate praise formerly lavished on tropical vegetation has received many shocks from recent travellers. In Kaffirland, South Africa, I have seen one or two forests fine enough to justify the enthusiasm of armchair word-painters of the tropics; but so far as the central plateau is concerned, the careful judgment of Mr. Alfred Russel Wallace respecting the equatorial belt in general—a judgment which has at once sobered all modern descriptions of tropical lands, and made imaginative people more content to stay at home—applies almost to this whole area. The fairy labyrinth of ferns and palms, the festoons of climbing plants blocking the paths and scenting the forests with their resplendent flowers, the gorgeous clouds of insects, the gayly-plumaged birds, the paroquets, the monkey swinging from his trapeze in the shaded bowers—these are unknown to Africa. Once a week you will see a palm; once in three months the monkey will cross your path; the flowers on the whole are few; the trees are poor; and to be honest, though the endless forest-clad mountains have a sublimity of their own, and though there are tropical bits along some of the mountain-streams of exquisite beauty, nowhere is there anything in grace and sweetness and strength to compare with a Highland glen. For the most part of the year these forests are jaded and sun-stricken, carpeted with no moss or alchemylla or scented woodruff, the bare trunks frescoed with few lichens, their motionless and unrefreshed leaves drooping sullenly from their sapless boughs. Flowers there are, small and great, in endless variety; but there is no display of flowers, no gorgeous show of blossom in the mass, as when the blazing gorse and heather bloom at home. The dazzling glare of the sun in the torrid zone has perhaps something to do with this want of color-effect in tropical nature; for there is always about ten minutes just after sunset, when the whole tone of the landscape changes like magic, and a singular beauty steals over the scene. This is the sweetest moment of the African day, and night hides only too swiftly the home-like softness and repose so strangely grateful to the over-stimulated eye.

Hidden away in these endless forests, like birds' nests in a wood, in terror of one another, and of their common foe, the slaver, are small native villages; and here in his virgin simplicity dwells primeval man, without clothes, without learning, without religion—the genuine child of nature, thoughtless, careless, and contented. This man is apparently quite happy; he has practically no wants. One stick, pointed, makes him a spear; two sticks rubbed together make him a fire: fifty sticks tied together make him a house. The bark he peels from them makes his clothes; the fruits which hang on them form his food. It is perfectly astonishing when one thinks of it what

* The more important of these trees are—*Napaca Kirkii, Brachystegia longifolia, Vitex umbrosa, Erythrina speciosa, Ficus sycamorus, Khaya senegalensis, Nuria congesta, Parinarium mobola, and Erythrophlœum guineensis.*

nature can do for the animal-man, to see with what small capital after all a human being can get through the world. I once saw an African buried. According to the custom of his tribe, his entire earthly possessions—and he was an average commoner—were buried with him. Into the grave, after the body, was lowered the dead man's pipe, then a rough knife, then a mud bowl, and last his bow and arrows—the bowstring cut through the middle, a touching symbol that its work was done. This was all. Four items, as an auctioneer would say, were the whole belongings for half a century of this human being. No man knows what a man is till he has seen what a man can be without, and be withal a man. That is to say, no man knows how great man is till he has seen how small he has been once.

The African is often blamed for being lazy, but it is a misuse of words. He does not need to work; with so bountiful a nature round him it would be gratuitous to work. And his indolence, therefore, as it is called, is just as much a part of himself as his flat nose, and as little blameworthy as slowness in a tortoise. The fact is Africa is a nation of the unemployed.

This completeness, however, will be a sad drawback to development. Already it is found difficult to create new wants; and when labor is required, and you have already paid your man a yard of calico and a string of beads, you have nothing in your possession to bribe him to another hand's turn. Nothing almost that you have would be the slightest use to him. Among the presents which I took for chiefs, I was innocent enough to include a watch. I might as well have taken a grand piano. For months I never looked at my own watch in that land of sunshine. Besides, the mere idea of time has scarcely yet penetrated the African mind, and forms no element whatever in his calculations. I wanted on one occasion to catch the little steamer on the Shiré, and pleaded this as an excuse to a rather powerful chief, whom it would have been dangerous to quarrel with, and who would not let me leave his village. The man merely stared. The idea of any one being in a hurry was not only preposterous but inconceivable, and I might as well have urged as my reason for wishing away that the angles of a triangle are equal to two right angles.

This difference in ideas is the real obstacle to African travelling, and it raises all sorts of problems in one's mind as to the nature of ideas themselves. I often wished I could get inside an African for an afternoon, and just see how he looked at things; for I am sure our worlds are as different as the color of our skins.

Talking of skins, I may observe in passing that the highland African is not a negro, nor is his skin black. It is a deep full-toned brown, something like the color of a good cigar. The whole surface is diced with a delicate pattern, which gives it great richness and beauty, and I often thought how effective a row of books would be bound in native-morocco.

No one knows exactly who these people are. They belong, of course, to the great Bantu race; but their origin is obscure, their tribal boundaries are unmapped, even their names are unknown, and their languages—for there are many—are unintelligible. A fine-looking people, quiet and domestic, their life-history from the cradle to the grave is of the utmost simplicity. Too ill armed to hunt, they live all but exclusively on a vegetable diet. A small part of the year they depend, like the monkeys, upon wild fruits and herbs; but the staple food is a small tasteless millet-seed which they grow in gardens, crush in a mortar, and stir with water into a thick porridge. Twice a day, nearly

all the year round, each man stuffs himself with this coarse and tasteless dough, shovelling it into his mouth in handfuls, and consuming at a sitting a pile the size of an ant-heap. His one occupation is to grow this millet, and his gardening is a curiosity. Selecting a spot in the forest, he climbs a tree, and with a small home-made axe lops off the branches one by one. He then wades through the litter to the next tree, and hacks it to pieces also, leaving the trunk standing erect. Upon all the trees within a circle of thirty or forty yards diameter his axe works similar havoc, till the ground stands breast-high in leaves and branches. Next, the whole is set on fire and burnt to ashes. Then, when the first rains moisten the hard ground and wash the fertile chemical constituents of the ash into the soil, he attacks it with his hoe, drops in a few handfuls of millet, and the year's work is over. But a few weeks off and on are required for these operations, and he may then go to sleep till the rains are over, assured of a crop which never fails, which is never poor, and which will last him till the rains return again.

Between the acts he does nothing but lounge and sleep; his wife, or wives, are the millers and bakers; they work hard to prepare his food, and are rewarded by having to take their own meals apart, for no African would ever demean himself by eating with a woman. I have tried to think of something else that these people habitually do, but their vacuous life leave, nothing more to tell.

Apart from eating, their sole occupation is to talk, and this they do unceasingly, emphasizing their words with a marvellous wealth of gesticulation. Talking, indeed, is an art here—the art it must once have been in Europe before the newspaper drove it out of fashion. The native voices are sometimes highly musical, though in the strict sense the people have no notion whatever of singing; and the languages themselves are full of melody. Every word, like the Italian, ends in a vowel, and when well spoken they are exceedingly effective and full of character.

Notwithstanding their rudimentary estate, the people of Africa have the beginnings of all the more characteristic things that make up the life of civilized man. They have a national amusement, the dance; a national musical instrument, the drum; a national drink, *pombe;* a national religion, the fear of evil spirits. Their chamber of justice is a council of head-men or chiefs; their court of appeal the *muavi*, or poison-cup. No new thing is found here that is not in some form in modern civilization; no new thing in civilization but has its embryo and prophecy in the simpler life of these primitive tribes. To the ignorant these men are animals; but the eye of evolution looks on them with a kindlier and more instructed sense. They are what we were once; possibly they may become what we are now.

What, then, is to become of this strange people and their land? With the glowing figures of a very distinguished traveller in our minds, are we to expect that the Shiré and Congo routes have but to be connected with New York and Manchester to cause at once a revolution among the people of Africa and in the commerce of the world? We hear two criticisms upon that subject. One complains that while Mr. Stanley emphasizes in the most convincing way the thousands of miles of cloth the African is waiting to receive from Europe, he is all but silent as to what Europe is to get in return. A second remark is that Africa has nothing to give in return, and never will have.

The facts of the case briefly, as it seems to me, are these:—

First, The only thing of value the interior of Africa produces at present

in any quantity is ivory. There is still, undoubtedly, a supply of this precious material in the country—a supply which may last yet for fifteen or twenty years. But it is well to frame future calculation on the certainty of this abnormal source of wealth ceasing, as it must do, in the immediate future.

Second, Africa already produces in a wild state a number of vegetable and other products of considerable commercial value; and although the soil can only be said to be of average fertility, there is practically no limit to the extent to which these could be developed.

Wild indigo—the true *indigofera tinctoria*—is already growing on the hills of the interior. The Londolphia, an indiarubber-bearing creeper, is to be seen on most of the watercourses; and a variety of the *Ficus elastica*, the well-known rubber plant, abounds on Lake Nyassa. The orchilla weed is common. The castor-oil plant, ginger, and other spices, the tobacco-plant, the cotton plant, and many fibre-yielding grasses, are also found; and oil-seeds of every variety and in endless quantity are grown by the natives for local use.

The fatal drawback, meantime, to the further development of these comparatively invaluable products is the transit, carriage to the coast from Nyassa or Tanganyika being almost prohibitive. Up till very recently only two native products have ever been exported from this region—indiarubber and beeswax, and these in but trifling quantity. But there is no reason why these products should not be largely developed, and freights must become lower and lower every year. In addition to the plants named, the soil of Central Africa is undoubtedly adapted for growing coffee; and the Cinchona would probably flourish well on the higher grounds of the Tanganyika plateau.

I must not omit to mention in this connection that an attempt is now being made, and so far with marked success, to form actual plantations in the interior of Africa; and the result of the experiment ought to be watched with exceptional interest. Mr. Moir, on behalf of the African Lakes Company, and the Brothers Buchanan on their own account, and also Mr. Scott, with remarkable industry and enterprise have each formed at Blantyre a coffee plantation of considerable size. The plants, when I saw them, were still young, but very healthy and promising, and already a first crop of fine coffee-berries hung from the trees, and has since been marketed. These same gentlemen have also grown heavy crops of wheat; and Mr. Buchanan has succeeded well with sugar-cane., potatoes and other English vegetables. The manual work here has been entirely done by natives; and an immense saving to resident Europeans will be effected when the interior is able to provide its own food supplies, for at present wheat, coffee, and sugar, have all to be imported from home.

With so satisfactory an account of the possibilities of the country, the only question that remains is this—Can the African native really be taught to work?

This question I answer unhesitatingly in the affirmative. I have described Africa as a nation of the unemployed. But the sole reason for the current impression that the African is an incorrigible idler is that at present there is really nothing for him to do. But that he can work and will work when the opportunity and inducement offer has been proved by experiment. The coast native, as all must testify who have seen him in the harbor of Zanzibar, Mozambique, Delagoa Bay, Natal, or the other eastern ports, is, with all allowances, a splendid worker; and though the experiment has seldom been tried in the interior, it is well known that the capacity is there and wherever encouraged yields re-

sults beyond all expectation. Probably the severest test to which the native of Central Africa has ever been put is the construction of the Stevenson road, between Lakes Nyassa and Tanganyika. Forty-six miles of that road—probably the only thing of the kind in Central Africa—have already been made entirely by native labor, and the work could not have been better done had it been executed by English navvies. I have watched by the day a party of seventy natives working at a cutting upon that road. Till three or four years ago none of them had ever looked upon a white man; nor, till a few months previously, had one of them seen a spade, a pickaxe, or a crowbar. Yet these savages handled their tools to such purpose that, with only a single European superintendent, they have made a road, full of difficult cuttings and gradients, which would not disgrace a railway contractor at home. The workmen keep regular hours—six in the morning till five at night, with a rest at mid-day—work steadily, continuously, willingly, and above all, merrily. This goes on, observe, in the heart of the tropics, almost under the equator itself, where the white man's energy evaporates, and leaves him so limp that he cannot even be an example to his men. This goes on too without any compulsion; the natives flock from far and near, sometimes from long distances, to try this new sensation of work. These men are not slaves, but volunteers; and though they are paid by the fortnight, many will remain at their post the whole season through. The only bribe for all this work is a yard or two of calico per week per man; so that it seems to me one of the greatest problems of the future of Africa is here solved. In capacity the African is fit to work, in inclination he is willing to work, and in actual experiment he has done it; so that with capital enlisted and wise heads to direct these energies, with considerate employers who will remember that these men are but children, this vast nation of the unemployed may yet be added to the slowly growing list of the world's producers.

Africa at this moment has an impossible access, a perilous climate, a penniless people, an undeveloped soil. So once had England. It may never be done; other laws may operate, unforeseen factors may interfere; but there is nothing in the soil, the products, the climate, or the people of Africa to forbid its joining even at this late day in the great march of civilization.

IV.

THE HEART-DISEASE OF AFRICA.

ITS PATHOLOGY AND CURE.

The life of the native African is not all idyl. It is darkened by a tragedy whose terrors are unknown to any other people under heaven. Of its mild domestic slavery I do not speak, nor of its revolting witchcraft, nor of its endless quarrels and frequent tribal wars. These minor evils are lost in the shadow of a great and national wrong. Among these simple and unprotected tribes, Arabs—uninvited strangers of another race and nature—pour in from the North and East, with the deliberate purpose of making this paradise a hell. It seems the awful destiny of this homeless people to spend their lives in breaking up the homes of others. Wherever they go in Africa the followers of Islam are the destroyers of peace, the breakers up of the patriarchal life, the dissolvers of the family tie. Already they hold the whole Continent under one reign of terror. They have effected this in virtue of one thing—they possess fire-arms; and they do it

for one object—ivory and slaves, for these two are one. The slaves are needed to buy ivory with; then more slaves have to be stolen to carry it. So living man himself has become the commercial currency of Africa. He is locomotive, he is easily acquired, he is immediately negotiable.

Arab encampments for carrying on a wholesale trade in this terrible commodity are now established all over the heart of Africa. They are usually connected with wealthy Arab traders at Zanzibar and other places on the coast, and communication is kept up by caravans which pass, at long intervals, from one to the other. Being always large and well supplied with the material of war, these caravans have at their mercy the feeble and divided native tribes through which they pass, and their trail across the Continent is darkened with every aggravation of tyranny and crime. They come upon the scene suddenly; they stay only long enough to secure their end, and disappear only to return when a new crop has arisen which is worth the reaping.

Sometimes these Arab traders will actually settle for a year or two in the heart of some quiet community in the remote interior. They pretend perfect friendship; they molest no one; they barter honestly. They plant the seeds of their favorite vegetables and fruits —the Arab always carries seeds with him—as if they meant to stay for ever. Meantime they buy ivory, tusk after tusk, until great piles of it are buried beneath their huts and all their barter-goods are gone. Then one day, suddenly, the inevitable quarrel is picked. And then follows a wholesale massacre. Enough only are spared from the slaughter to carry the ivory to the coast; the grass-huts of the village are set on fire; the Arabs strike camp; and the slave-march, worse than death, begins.

This last act in the drama, the slave-march, is the aspect of slavery which, in the past, has chiefly aroused the passions and the sympathy of the outside world, but the greater evil is the demoralization and disintegration of communities by which it is necessarily preceded. It is essential to the traffic that the region drained by the slaver should be kept in perpetual political ferment; that, in order to prevent combination, chief should be pitted against chief; and that the moment any tribe threatened to assume a dominating strength it should either be broken up by the instigation of rebellion among its dependencies, or made a tool of at their expense. The inter-relation of tribe with tribe is so intricate that it is impossible to exaggerate the effect of disturbing the equilibrium at even a single centre. But, like a river, a slave-caravan has to be fed by innumerable tributaries all along its course—at first in order to gather a sufficient volume of human bodies for the start, and afterwards to replace the frightful loss by desertion, disablement, and death.

Many at home imagine that the death-knell of slavery was struck with the events which followed the death of Livingstone. In the great explorer's time we heard much of slavery; we were often appealed to; the Government busied itself; something was really done. But the wail is already forgotten, and England hears little now of the open sore of the world. But the tragedy I have alluded to is repeated every year and every month —witness such recent atrocities as those or the Upper Congo the Kassai and Sankaru region prescribed by Wissmann, of the Welle-Inakua district referred to by Van Gele. It was but yesterday that an explorer, crossing from Lake Nyassa to Lake Tanganyika, saw the whole southern end of Tanganyika peopled with large and prosperous villages.

The next to follow him found not a solitary human being—nothing but burned homes and bleaching skeletons. It was but yesterday—the close of 1887—that the Arabs at the north end of Lake Nyassa, after destroying fourteen villages with many of their inhabitants, pursued the population of one village into a patch of tall dry grass, set it on fire, surrounded it, and slew with the bullet and the spear those who crawled out from the more merciful flames. The Wa-Nkonde tribe, to which these people belonged, were, until this event, one of the most prosperous tribes in East Central Africa. They occupied a country of exceptional fertility and beauty. Three rivers, which never failed in the severest drought run through their territory, and their crops were the richest and most varied in the country. They possessed herds of cattle and goats; they fished in the lake with nets; they wrought iron into many-patterned spear-heads with exceptional ingenuity and skill; and that even artistic taste had begun to develop among them was evident from the ornamental work upon their huts, which were themselves unique in Africa for clever construction and beauty of design. This people, in short, by their own inherent ability and the natural resources of their country, were on the high road to civilization. Now mark the swift stages in their decline and fall. Years ago an almost unnoticed rill from that great Arab stream, which with noiseless current and ever-changing bed has never ceased to flow through Africa, trickled into the country. At first the Arab was there on suffrance; he paid his way. Land was bought from the Wa-Nkonde chiefs, and their sovereignty acknowledged. The Arab force grew. In time it developed into a powerful incursion, and the Arabs began openly to assert themselves. One of their own number was elevated to the rulership, with the title of "Sultan of Nkonde." The tension became great, and finally too severe to last. After innumerable petty fights the final catastrophe was hurried on, and after an atrocious carnage the remnant of the Wa-Nkonde were driven from their fatherland. Such is the very last chapter in the history of Arab rule in Africa.

The Germans, the Belgians, the English, and the Portuguese, are crying out at present for territory in Central Africa. Meantime humanity is crying out for some one to administer the country; for some one to claim it, not by delimiting a frontier-line upon a map with colored crayons, but by seeing justice done upon the spot; for some one with a strong arm and a pitiful heart to break the Arab yoke and keep these unprotected children free. It has been reserved for a small company of English gentlemen to arrest the hand of the raider in the episode I have just described. While Germany covets Nyassa-land, while England has sent a consul there, *without protection*, to safeguard British missionary and trading interests, two agents of the African Lakes Company, two missionaries, the British Consul at Mozambique, with two companions who happened to be in Nyassa-land on scientific work, have, at the risk of their lives, averted further war, and with their own rifles avenged the crime.

But this fortuitous concourse of English rifles cannot be reckoned upon every day; nor is it the part of the missionary and the trader to play the game of war. The one thing needed for Africa at present is some system of organized protection to the native, and the decisive breaking of the Arab influence throughout the whole interior. These events at Lake Nyassa have brought this subject once more before the civilized world, and I may briefly state the situation as it at present stands.

Five years ago the British cruisers which had been for years engaged

in suppressing the slave-trade were tempted to relax their efforts. They had done splendid service. The very sight of the great hull of the *London*, as she rocked in the harbor of Zanzibar, had a pacific influence; and as the caravans from the interior came and went at intervals of years and found the cruisers' cannon still pointing to their sultan's palace, they carried the fear of England over the length and breadth of Africa. The slave-trade was seriously discouraged, and, so far as the coast traffic was concerned, it was all but completely arrested. What work, up to this point, was done, was well done; but, after all, only half the task had ever been attempted. It was not enough to stop the sewer at its mouth; its sources in the heart of Africa should have been sought out and purified. But now that even the menace at Zanzibar no longer threatened the slavers, their work was resumed with redoubled energy. The withdrawal of the *London* was interpreted to mean either that England conceived her work to be done or that she had grown apathetic and would interfere no more.

The consequences were almost immediately disastrous. A new license to devastate, to murder, and to enslave, was telegraphed all over Africa, and speedily found expression, in widely separated parts of the country, in horrors the details of which can never be known to the civilized world. The disturbances on Lake Nyassa undoubtedly belong, though indirectly, to this new category of crime. Already the Arabs have learned that there is no one now to take them to task. In one district after another they have played their game and won; and with ample power, with absolute immunity from retribution, and with the sudden creation of a new demand for slaves in a quarter of which I dare not speak further here, their offences can only increase in number and audacity. It is remarkable in the Wa-Nkonde episode that, for the first time probably in Central Africa, the Mohammedan defiance to the Christian power was open and undisguised. Hitherto the Arab worked in secret. The mere presence of a white man in the country was sufficient to stay his hand. On this occasion the Arab not only did not conceal his doings from the Europeans, nor flee when he was remonstrated with, but turned and attacked his monitors. The political significance of this is plain. It is part of a policy. It is a challenge to Europe from the whole Mohammedan power. Europe in Africa is divided; Mohammedanism is one. No isolated band of Arabs would have ventured upon such a line of action unless they were perfectly sure of their ground. Nor is there any reason why they should not be sure of their ground. Europe is talking much about Africa; it is doing nothing. This the Arab has discerned. It is one of the most astounding facts in morals that England should have kept the Arab at bay so long. But the time of probation is over. And the plain issue is now before the world—Is the Arab or the European henceforth to reign in Africa?

How the European could reign in Africa is a simple problem. The real difficulty is as to who in Europe will do it. Africa is claimed by everybody, and it belongs to nobody. So far as the Nyassa region is concerned, while the Portuguese assert their right to the south and west, scarcely one of them has ever set foot in it; and while the Germans claim the north and east, their pretension is based neither upon right of discovery, right of treaty, right of purchase, right of conquest, nor right of possession, but on the cool audacity of some chartographer in Berlin, who, in delimiting a tract of country recognized as German by the London Convention of 1886, allowed his paint-brush to color some tens of thousands of square

miles beyond the latitude assigned. To England it is a small matter politically who gets Africa. But it is of moment that those who secure the glory of annexation should not evade the duty of administration. The present condition of Africa is too critical to permit so wholesale a system of absentee landlordism; and it is the duty of England, so far at least as the Nyassa region is concerned, to insist on the various claimants either being true to their assumed responsibilities or abandoning a nominal sovereignty.

It is well known,—it is certain,—that neither Portugal nor Germany will ever administer this region. If they would, the problem would be solved, and England would gladly welcome the release; the release, for, although England has never aided this country with a force of arms, she has for some time known that in some way, direct or indirect, she ought to do it. This country is in a special sense the *protégé* of England. Since Livingstone's death the burden of it has never really left her conscience. The past relation of England to Nyassa-land, and her duty now, will be apparent from the following simple facts:—

Lake Nyassa was discovered by David Livingstone. At the time he was acting as Her Majesty's Consul, and was sent to Africa with a Government Expedition, which was equipped not to perform an exceptional and romantic piece of work, but in accordance with a settled policy on the part of England. "The main object of the Zambesi Expedition," says Livingstone, "as our instructions from Her Majesty's Government explicitly stated, was to extend the knowledge already attained of the geography, and mineral and agricultural resources, of Eastern and Central Africa; to improve our acquaintance with the inhabitants, and to endeavor to engage them to apply themselves to industrial pursuits, and to the cultivation of their lands, with a view to the production of raw material to be exported to England in return for British manufactures; and it was hoped that, by encouraging the natives to occupy themselves in the development of the resources of the country, a considerable advance might be made towards the extinction of the slave-trade, as they would not be long in discovering that the former would eventually be a more certain source of profit than the latter. The Expedition was sent *in accordance with the settled policy of the English Government;* and the Earl of Clarendon being then at the head of the Foreign Office, the Mission was organized under his immediate care. When a change of Government ensued we experienced the same generous countenance and sympathy from the Earl of Malmesbury as we had previously received from Lord Clarendon; and on the accession of Earl Russell to the high office he has so long filled we were always favored with equally ready attention and the same prompt assistance. Thus *the conviction was produced that our work embodied the principles not of any one party, but of the hearts of the statesmen and of the people of England generally.*"

Encouraged by this national interest in Africa, the churches of England and Scotland attempted to follow up the work of Livingstone in one at least of its aspects, by sending missionaries into the country. These have already succeeded in establishing themselves in one district after another, and are daily extending in numbers and influence.

In order to perpetuate a scarcely less important branch of the movement initiated by Livingstone,—a department specially sanctioned, as the above extract shows, by the English Government—the African Lakes Company was formed in 1878. Its object was to open up and develop the regions of East Central Africa from the Zambesi to Tanganyika; to make employments for the

native peoples, to trade with them honestly, to keep out rum, and, so far as possible, gunpowder and firearms, and to co-operate and strengthen the hands of the missionary. It has already established twelve trading stations, manned by a staff of twenty-five Europeans and many native agents. The *Ilala* on Lake Nyassa belongs to it; and it has just placed a new steamer to supersede the *Lady Nyassa* on the the river Shiré. It has succeeded in starting a flourishing coffee plantation in the interior, and new sources of wealth are being gradually introduced. For the first time, on the large scale, it has taught the natives the meaning and the blessings of work. It has acted, to some extent, as a check upon the slave-trade; it has prevented inter-tribal strife, and helped to protect the missionaries in time of war. The African Lakes Company, in short, modest as is the scale on which it works, and necessarily limited as are its opportunities, has been for years the sole administering hand in this part of Africa. This Company does not exist for gain;—or exists for gain only in the sense that commercial soundness is the only solid basis on which to build up an institution which can permanently benefit others. A large, amount of private capital has been expended by this Company; yet during all the years it has carried on its noble enterprise, it has re-invested in Africa all that it has taken from it.

All this British capital, all the capital of the Missions, all these various and not inconsiderable agencies, have been tempted into Africa largely in the hope that the old policy of England would not only be continued but extended. England has never in theory departed from the position she assumed in the days of the Zambesi Expedition. On the contrary, she has distinctly recognized the relation between her Government and Africa. She has continued to send out British Consuls to be the successors of Livingstone in the Nyassa region. When the first of these, Captain Foote, R. N., died in the Shiré Highlands in 1884, the English Government immediately sent another to take his place. But this is the last thing that has been done. The Consul is there as a protest that England has still her eye on Africa. But Africa needs more than an eye. And when, as happened the other day, one of Her Majesty's representatives was under Arab fire for five days and nights on the shores of Lake Nyassa, this was brought home to us in such practical fashion as to lead to the hope that some practical measures will now be taken.

I do not presume to bring forward a formal proposal; but two things occur to one as feasible, and I shall simply name them. The first is for England, or Germany, or France, or some one with power and earnestness, to take a firm and uncompromising stand at Zanzibar. Zanzibar, as the Arab capital, is one of the keys of the situation, and any lesson taught here would be learned presently by the whole Mohammedan following in the country.

The other key to the situation is the vast and splendid water-way in the heart of Africa—the Upper Shiré, Lake Nyassa, Lake Tanganyika, and the Great Lakes generally. As a base for military or patrol operations nothing better could be desired than these great inland seas. A small steamer upon each of them —or, to begin with, upon Nyassa and Tanganyika—with an associated depôt or two of armed men on the higher and healthier plateaux which surround them, would keep the whole country quiet. Only a trifling force of well-drilled men would be needed for this purpose. They might be whites, or blacks and whites; they might be Sikhs or Pathans from India; and the expense is not to be named consider-

ing the magnitude of the results—the pacification of the entire equatorial region—that would be achieved. That expense could be borne by the Missions, but it is not their province to employ the use of force; it could be borne by the Lakes Company, only they deserve protection from others rather than that this should be added to the large debt civilization already owes them; it could be done by the Free Congo State, —and if no one else is shamed into doing it, this further labor of love may fall into its hands. But whether alone, or in co-operation with the few and overburdened capitalists of the country, or in conjunction with foreign powers, England will be looked to to take the initiative with this or a similar scheme.

The barriers in the way of Government action are only two, and neither is insurmountable. The one is Portugal, which owns the approaches to the country; the other is Germany, which has inland interests of her own. Whether England could proceed in the face of these two powers would simply depend on how it was done. As a mere political move such an occupation of the interior might at once excite alarm and jealousy. But wearing the aspect of a serious mission for the good of Africa, instigated not by the Foreign Office but by the people of England, it is impossible to believe that the step could either be misunderstood or opposed. It is time the nations looked upon Africa as something more than a chessboard. And even if it were but a chessboard, the players on every hand are wise enough to know that whatever is honestly done to relieve this suffering continent will react in a hundred ways upon the interests of all who hold territorial rights within it.

A beginning once made, one might not be unduly sanguine in anticipating that the meshes of a pacific and civilizing influence would rapidly spread throughout the country. Already the missionaries are pioneering everywhere, prepared to stay and do their part; and asking no more from the rest of the world than a reasonable guarantee that they should be allowed to live. Already the trading companies are there, from every nationality, and in every direction ready to open up the country, but unable to go on with any confidence or enthusiasm till their isolated interests are linked together and secured in the presence of a common foe. The territories of the various colonies are slowly converging upon the heart of Africa, and to unite them in an informal defensive alliance would not be impossible. With Emin Pasha occupying the field in the north; with the African Lakes Company, the British East African Association, and the German Association, in the east; with the Congo Free State in the west, and the British Bechuanaland in the south, a cordon is already thrown around the Great Lakes region, which requires only to have its several parts connected with one another and with central forces on the Lakes, to secure the peace of Africa.

V.

WANDERINGS ON THE NYASSA-TANGANYIKA PLATEAU.

A TRAVELLER'S DIARY.

With a glade in the forest for a study, a bale of calico for a table, and the sun vertical and something under a billion centigrade, diary-writing in the tropics is more picturesque than inspiring. To keep a journal, however, next to keeping his scalp, is the one thing for which the consistent traveller will go through fire and water; and the dusky native who carries the faded note-books on the march is taught

to regard the sacredness of his office more than if he drove the car of Juggernaut. The contents of these mysterious note-books, nevertheless, however precious to those who write them, are, like the photographs of one's relations, of pallid interest to others, and I have therefore conscientiously denied myself the joy of exhibiting such offspring of the wilderness as I possess to my confiding reader.

But as the diary form has advantages of its own, I make no apology at this stage for transcribing and editing a few rough pages. Better, perhaps, than by a more ordered narrative, they may help others to enter into the traveller's life, and to illustrate what the African traveller sees and hears and does. I shall disregard names, and consecutive dates, and routes. My object is simply to convey some impression of how the world wags in a land unstirred by civilization, and all but untouched by time.

29th September.—Left Karongas, at the north end of Lake Nyassa, at 10.30, with a mongrel retinue of seven Mandalla natives, twelve Bandawé Atongas, six Chingus, and my three faithfuls—Jingo, Moolu, and Seyid. Total twenty-eight. Not one of my men could speak a word of English. They belonged to three different tribes and spoke as many languages; the majority, however, knew something of Chinanja, the lake language, of which I had also learned a little, so we soon understood one another. It is always a wise arrangement to have different tribes in a caravan, for in the event of a strike, and there are always strikes, there is less chance of concerted action. Each man carried on his head a portion of my purse—which in this region consists solely of cloth and beads; while one or two of the more dependable were honored with the transportation of the tent, collecting-boxes, provisions, and guns.

The road struck into a banana grove, then through a flat country fairly well wooded with a variety of trees, including many palms and a few baobabs. The native huts dotted over this rich flat are the best I have seen in Africa. The roofs are trimly thatched, and a rude carving adorns door-post and lintel. After seven miles the Rukuru is crossed—a fine stream rippling over the sand, with large flakes of mica tumbling about in the current, and sampling the rocks of the distant hills. The men laid down their loads, and sprawled about like crocodiles in the water as I waded across. A few yards off is a village, where a fire was quickly lit, and the entire population turned out to watch the white man nibble his lunch. The consumption at this meal being somewhat slight, and the *menu* strange to my audience, I saw that they regarded the white man's effort at nutrition with feelings of contempt. "The M'sungu eats nothing," whispered one, "he must die." The head man presently came asking beads; but, as I had none unpacked, two stray trinkets and a spoonful of salt more than satisfied him. On getting the salt he deftly twisted a leaf into a little bag, and after pouring all the salt into it, graciously held out his hand to a troop of small boys who crowded round, and received one lick each of his empty palm. Salt is perhaps the greatest luxury and the greatest rarity the north-end African can have, and the avidity with which these young rascals received their homœopathic allowance proved the instinctiveness of the want. I have often offered native boys the choice between a pinch of salt and a knot of sugar, and they never failed to choose the first. For return-present the chief made over to me two large gourds filled with curds, of which, of course, I pretended to drink deeply before passing it on to the men.

Three miles of the same country, with tall bean-plants about, castor

oil, and maize, but no villages in sight. Bananas unusually fine, and Borassus everywhere. At the tenth or eleventh mile we reached the fringe of hills bordering the higher lands, and, taking advantage of a passage about half a mile wide which has been cut by the river, penetrated the first barrier—a low rounded hill of conglomerate, fine in texture, and of a dark-red color. Flanking this for two miles, we entered a broad oval expansion among the hills, the site apparently of a former lake. Winding along with the river for a mile or two more, and passing through a narrow and romantic glen, we emerged in a second valley, and camped for the night on the banks of the stream. On the opposite side stood a few native huts, and the occupants, after much reconnoitring, were induced to exchange some *ufa* and sweet potatoes for a little cloth.

1st October.—Moolu peered into my tent with the streak of dawn to announce a catastrophe. Four of the men had run away during the night. All was going so well yesterday that I flattered myself I was to be spared this traditional experience—the most exasperating of all the traveller's woes, for the whole march must be delayed until fresh recruits are enlisted to carry the deserters' loads. The delinquents were all Bandawé men. They had no complaint. They stole nothing. It was a simple case of want of pluck. They were going into a strange land. The rainy season was coming on. Their loads were full-weight. So they got homesick and ran. I had three more Bandawé men in the caravan, and, knowing well that the moment they heard the news they would go and do likewise, I ordered them to be told what had happened and then sent to my tent. In a few moments they appeared; but what to say to them? Their dialect was quite strange to me, and yet I felt I must impress them somehow. Like the judge putting on the black cap, I drew my revolver from under my pillow, and, laying it before me, proceeded to address them. Beginning with a few general remarks on the weather, I first briefly sketched the geology of Africa, and then broke into an impassioned defence of the British Constitution. The three miserable sinners—they had done nothing in the world—quaked like aspens. I then followed up my advantage by intoning, in a voice of awful solemnity, the enunciation of the Forty-Seventh Proposition of Euclid, and then threw my all into a blood-curdling *Quod erat demonstrandum.* Scene two followed when I was alone; I turned on my pillow and wept for shame. It was a prodigious piece of rascality, but I cannot imagine anything else that would have done, and it succeeded perfectly. These men were to the end the most faithful I had. They felt thenceforth they owed me their lives; for, according to African custom, the sins of their fellow-tribesmen should have been visited upon them with the penalty of death.

Seyid and Moolu scoured the country at once for more carriers, but met with blank refusals on every side. Many natives passed the camp, but they seemed in unusual haste and something of local importance was evidently going on. We were not long in doubt as to its nature. It was war. The Angoni were in force behind a neighboring hill, and had already killed one man. This might have been startling, but I treated it as a piece of gossip, until suddenly a long string of armed and painted men appeared in sight and rushed past me at the double. They kept perfect step, running in single file, their feet adorned with anklets of rude bells which jingled in time and formed quite a martial acccompaniment. The centre man held aloft a small red and white flag, and each warrior carried a large shield and

several light barbed spears. The regiment was led by a fantastic-looking creature, who played a hideous slogan on a short pan-pipe. This main body was followed at intervals by groups of twos and threes who had been hastily summoned from their work, and I must say the whole turnout looked very like business. The last of the warriors had scarcely disappeared before another procession of a different sort set in from the opposite direction. It consisted of the women and children from the threatened villages farther up the valley. It was a melting sight. The poor creatures were of all ages and sizes, from the tottering grandmother to the week-old infant. On their heads they carried a miscellanous collection of household gods, and even the little children were burdened with a calabash, a grass-mat, a couple of fowls, or a handful of sweet-potatoes. Probably the entire effects of the villages were represented in these loads. Amongst the fugitives were a few goats and one or two calves, and a troop of boys brought up the rear driving before them a herd of cows. The poor creatures quickened their pace as they passed my tent, and eyed me as furtively as if I and my men had been a detachment from the Angoni executing a flank movement. The hamlet opposite our camp, across the river, which had gladdened us the night before with its twinkling fires, its inhabitants sitting peacefully at their doors or fishing in the stream, was already deserted —the men to fight, the women to flee for their lives they knew not whither. This is a common chapter in African history. Except among the very largest tribes no man can call his home his own for a month.

I was amazed at the way my men treated the affair. They lounged about camp with the most perfect indifference. This was accounted for by my presence. The mere presence of a white man is considered an absolute guarantee of safety in remoter Africa. It is not his guns or his imposing retinue ; it is simply himself. He is not mortal, he is a spirit. Had I not been there, or had I shown the white feather, my men would have stampeded for Nyassa in a body. I had learned to understand the feeling so thoroughly that the events of the morning gave me no concern whatever, and I spent the day collecting in the usual way.

It was impossible to go on and leave the loads ; it was equally impossible to get carriers at hand. So I despatched Seyid with a letter to the station on the Lake requesting six or eight natives to be sent from there. This meant a delay of two or three days at least, which, with the rains so near, was serious for me.

Made a "fly" for the tent; collected, and read. One only feels the heat when doing nothing. As the sun climbed to its zenith my men put up for themselves the most enticing bowers. They were ingeniously made with interlacing grasses and canes, and densely thatched with banana leaves.

Tried twice to bake bread, with Jingo and Moolu as assistant cooks. Both attempts dismal failures, so I had to draw on the biscuit-tins. I have plenty of fowls, bought yesterday for beads. Maraya down with fever. One of the carriers, Siamuka, who had been left behind sick, straggled into camp, looking very ill indeed. Physicked him and gave him four yards of cloth to wrap himself in. Towards sunset I began to get anxious for news of battle. The arrival of the armed band which had passed in the morning soon gratified me. There had been no battle. There had been no Angoni. It was simply a scare—one of those false alarms which people in these unsettled circumstances are constantly liable to. All evening the women and children were trooping back to their homes ; and next morning our friends op-

posite were smoking their pipes at the doors again, as if nothing had happened.

Tuesday, 2d October.—After morning cocoa had a walk with my hammer to examine the sections in the valley. Back to a good breakfast, cooked with all the art of Jingo, the real cook being at Karongas with the flag of distress. Moolu ill. This is the third man down with fever since we left the Lake. Bought some ufa and beans. Dispensed needles, and bent pins for fish-hooks, among the men. Held a great washing with Jingo. Towards the afternoon the reinforcements arrived from Karongas. The chief was drunk, it appeared, when my messenger reached him ; but Mr. Munro at the Lake kindly sent me a number of his own men.

Another of my carriers begged leave to dissolve our partnership, and produced two youths whom he had beguiled into taking his load. His plea was that he was in bad odor at Mweni-wanda, and was afraid to go on. My own impression is that he found the load which he carried—on his head, like all Africans—was spoiling the cut of his hair. Even Africa has its exquisities, and this man was the swell all over. By "all over," I mean, of course, all over his head, for as his hair is his only clothing, except the bark loincloth of which the cut cannot well be varied, he had poured out the whole of his great soul upon his coiffure. At the best the African's hair is about the length of a toy-shop poodle's ; but vanity can make even a fool creative, and out of this scanty material and with extraordinary labor he had compiled a masterpiece. First, heavily greased with ground-nut oil, it was made up into small-sized balls like black-currants, and then divided into symmetrical patterns, diamonds, circles, and parterres, designed with the skill of a landscape-gardener. To protect this work of art from nightly destruction, this gentleman always carried with him a pillow of special make. It was constructed of wood, and dangled conspicuously from his spear-head on the march. He sold it to me ultimately for a yard of calico—and he certainly would not sleep after the transaction till he had laid the foundations of another.

12th October.—Got under weigh at early dawn. Much shirking and dodging among the men for light loads. Formerly sudden and suspicious fevers used to develop at this critical juncture—by a not unaccountable coincidence among the men with the heaviest loads ; but my now well-known mixture, compounded of pepper, mustard, cold tea, citrate of magnesia, Epsom salts, anything else that might be handy, and a flavoring pinch of cinchona, has miraculously stayed the epidemic. But I forgive these merry fellows everything for wasting none of the morning coolness over toilet or breakfast. I need not say the African never washes in the morning ; but what is of more importance, he never eats. He rises suddenly from the ground where he has lain like a log all night, gives himself a shake, shoulders his load, and is off. Even at the mid-day halt he eats little ; but, if he can get it, will regale himself with a draught of water and a smoke. This last is a perfunctory performance, and one pipe usually serves for a dozen men. Each takes a whiff or two from the great wooden bowl, then passes it to his neighbor, and the pipe seldom makes a second round.

I often wondered how the natives produced a light when camping by themselves, and at last resolved to test it. So when the usual appeal was made to me for "motu," I handed them my vesta box with a single match in it. I generally struck the match for them, this being considered a very daring experiment, and I felt pretty sure they would make a mess of their one chance. It turned out as anticipated, and when they

handed back the empty box, I looked as abstracted and unapproachable as possible. After a little suspense, one of them slowly drew from the sewn-up monkey skin, which served for his courier-bag, a small piece of wood about three inches long. With a spear-head he cut in it a round hole the size of a threepenny-piece. Placing his spear-blade flat on the ground to serve as a base, he stretched over it a scrap of bark-cloth torn from his girdle, and then pinned both down with the perforated piece of wood, which a second native held firmly in position. Next he selected from among his arrows a slender stick of very hard wood, inserted it vertically in the hole, and proceeded to twirl it round with great velocity between his open palms. In less than half a minute the tinder was smoking sulkily, and after a few more twirls it was ready for further treatment by vigorous blowing, when it broke into active flame. The fire originates, of course, in the small soft piece of wood, from which sparks fall upon the more inflammable bark-cloth at the bottom of the hole.

Our daily programme, on the march, was something like this. At the first streak of dawn my tent was struck. There is no time for a meal, for the cool early hour is too precious in the tropics to waste over eating; but a hasty coffee while the loads were packing kept up the tradition of breakfast. In twenty minutes the men were marshalled, quarrels about an extra pound weight adjusted, and the procession started. At the head of the column I usually walked myself, partly to see the country better, partly to look out for game, and partly, I suppose, because there was no one else to do it. Close behind me came my own special valet—a Makololo—carrying my geological hammer, water-bottle, and loaded rifle. The white man, as a rule, carries nothing except himself and a revolver, and possibly a double-awned umbrella, which, with a thick pith helmet, makes sunstroke impossible. Next Jingo marched the cook, a plausible Mananja, who could cook little, except his version of where the missing victuals went to. After the cook came another gentleman's gentleman carrying a gun and the medicine chest, and after him the rank and file, with another gun-bearer looking out for deserters at the rear. From half-past five I usually trudged on till the sun made moving torture, about ten or eleven. When I was fortunate enough to find shade and water there was a long rest till three in the afternoon, and an anomalous meal, followed by a second march till sunset. The dreadful part of the day was the interval. Then observations were made, and specimens collected and arranged, each man having to fill a collecting-box before sunset. When this was over there was nothing else to do that it was not too hot to do. It was too hot to sleep, there was nothing to read, and no one to speak to; the nearest post-office was a thousand miles off, and the only amusement was to entertain the native chiefs, who used occasionally to come with their followers to stare at the white man. These interviews at first entertained one vastly, but the humbling performances I had to go through became most intolerable. Think of having to stand up before a gaping crowd of savages and gravely button your coat—they had never seen a coat; or, wonder of wonders, strike a match, or snap a revolver, or set fire to somebody's bark clothes with a burning-glass. Three or four times a day often I had to go through these miserable performances, and I have come home with a new sympathy for sword-swallowers, fire-eaters, the man with the iron jaw, and all that ilk.

The interview commenced usually with the approach of two or three terror-stricken slaves, sent by the chief as a preliminary to test whether or not the white man would eat them. Their presents, native grains

of some kind, being accepted, they concluded I was at least partly vegetarian, and the great man with his courtiers, armed with long spears, would advance and kneel down in a circle. A little speechifying followed, and then my return presents were produced—two or three yards of twopence-halfpenny calico; and if he was a very great chief an empty Liebig pot or an old jam tin was also presented with great ceremony. None of my instruments, I found, at all interested these people—they were quite beyond them; and I soon found that in my whole outfit there were not half a dozen things which conveyed any meaning to them whatever. They did not know enough even to be amazed. The greatest wonder of all perhaps was the burning-glass. They had never seen glass before, and thought it was *mazi* or water, but why the *mazi* did not run over when I put it in my pocket passed all understanding. When the light focused on the dry grass and set it ablaze their terror knew no bounds. "He is a mighty spirit," they cried, "and brings down fire from the sun!" This single remark contains the key to the whole secret of a white man's influence and power over all uncivilized tribes. Why a white man, alone and unprotected, can wander among these savage people without any risk from murder or robbery is a mystery at home. But it is his moral power, his education, his civilization. To the African the white man is a supreme being. His commonest acts are miracles; his clothes, his guns, his cooking utensils are supernatural. Everywhere his word is law. He can prevent death and war if he but speak the word. And let a single European settle, with fifty square miles of heathen round him, and in a short time he will be their king, their lawgiver, and their judge. I asked my men one day the question point blank—"Why do you not kill me and take my guns and clothes and beads?" "Oh," they replied, "we would never kill a spirit." Their veneration for the white man indeed is sometimes most affecting. When war is brewing, or pestilence, they kneel before him and pray to him to avert it; and so much do they believe in his omnipotence that an unprincipled man by trading on it, by simply offering pins, or buttons or tacks, or pieces of paper, or anything English, as charms against death, could almost drain a county of its ivory—the only native wealth.

The real dangers to a traveller are of a simpler kind. Central Africa is the finest hunting country in the world. Here are the elephant, the buffalo, the lion, the leopard, the rhinoceros, the hippopotamus, the giraffe, the hyæna, the eland, the zebra, and endless species of small deer and antelope. Then the whole country is covered with traps to catch these animal—deep pits with a jagged stake rising up in the middle, the whole roofed over with turf and grass, so exactly like the forest bed that only the trained eye can detect their presence. I have found myself walking unconsciously on a narrow neck between two of these pits, when a couple of steps to either side would almost certainly have meant death. Snakes too, and especially the hideous and deadly puff adder, may turn up at any moment; and in bathing, which one eagerly does at every pool, the sharpest lookout is scarcely a match for the diabolical craft of the crocodile.

13th October.—Walking through the forest to-day some distance ahead of my men, I suddenly came upon a rhinoceros. The creature—the rhino is solitary in his habits—was poking about the bush with its head down and did not see me, though not ten yards separated us. My only arms were a geological hammer and a revolver, so I had simply to lie down and watch him. Presently my gunbearer crawled

up, but unfortunately by this time the pachyderm had vanished, and was nowhere to be found. I broke my heart over it at the moment, though why in the world I should have killed him I do not in the least know now. In cold blood one resents Mr. Punch's typical Englishman—"What a heavenly morning! let's go and kill something!" but in presence of temptation one feels the veritable savage.

We are now at an elevation of about four thousand feet, and steadily nearing the equator, although the climate gives little sign of it. It is a popular mistake that the nearer one goes to the equator the temperature must necessarily increase. Were this so, Africa, which is the most tropical continent in the world, would also be the hottest; while the torrid zone, which occupies so large a portion of it, would be almost insupportable to the European. On the contrary, the nearer one goes to the equator in Africa it becomes the cooler. The reasons for this are twofold—the gradual elevation of the continent towards the interior, and the increased amount of aqueous vapor in the air. Central Africa is from three to five thousand feet above the level of the sea. Now for every three hundred feet of ascent the thermometer falls one degree. It is immensely cooler, therefore, in the interior than at the coast; and the equatorial zone all over the world possesses a climate in every way superior to that of the borders of the temperate region. At night, in Equatorial Africa, it is really cold, and one seldom lies down in his tent with less than a couple of blankets and a warm quilt. The heat of New York is often greater than that of Central Africa; for while in America a summer rarely passes without the thermometer reaching three figures, in the hottest month in Africa my thermometer never registered more than two on a single occasion—the highest actual point reached being 96°. Nowhere, indeed, in Africa have I experienced anything like the heat of a summer in Malta, or even of a stifling August in Southern Germany or Italy. On the other hand, the direct rays of the sun are necessarily more powerful in Africa; but so long as one keeps in the shade—and even a good umbrella suffices for this—there is nothing in the climate to disturb one's peace of mind or body. When one really feels the high temperature is when down with fever; or when fever, unknown to one, is coming on. Then, indeed, the heat becomes maddening and insupportable; nor has the victim words to express his feelings towards the glittering ball, whose daily march across the burnished and veilless zenith brings him untold agony.

15th to 22nd October. This camp is so well situated that I have spent the week in it. The programme is the same every day. At dawn Jingo came to my tent with early coffee. Went out with my gun for a morning stroll, and returned in an hour for breakfast. Thereafter I sorted the specimens captured the day before, and hung up the fatter insects to dry in the sun. Routing the ants from the boxes and provision stores was also an important and vexatious item. Some ants are so clever that they can break into everything, and others so small that they will crawl into anything: and between the clever ones, and the small ones, and the jam-loving ones, and the flour-eating ones, and the specimen-devouring ones, subsistence, not to say science, is a serious problem. The only things that have hitherto baffled them are the geological specimens; but I overhaul these regularly every morning along with the rest, in terror of one day finding some precocious creature browsing off my granites. After these labors I repaired to a natural bower in the dry bed of a shaded streamlet, where I spent

the entire day. Here, even at high noon, was perfect coolness, and rest and solitude unutterable. I lay among birds and beasts and flowers and insects, watching their ways, and trying to enter into their unknown lives. To watch uninterruptedly the same few yards of universe unfold its complex history; to behold the hourly resurrection of new living things, and miss no change or circumstance, even of its minuter parts; to look at all, especially the things you have seen before, a hundred times, to do all with patience and reverence—this is the only way to study nature.

Towards the afternoon the men began to drop in with their boxes of insects, each man having to collect a certain number every camp-day. If sufficient were not brought in the delinquent had to go back to the bush for more. At five or six I went back to my tent for dinner, and after an hour over the camp-fire turned in for the night. The chattering of the men all round the tent usually kept me awake for an hour or two. Their merriest time is just after sunset, when the great ufa-feast of the day takes place. The banter between the fires is kept up till the small hours, and the chief theme of conversation is always the white man himself—what the white man did, and what the white man said, and how the white man held his gun, and everything else the white man thought, looked, willed, wore, ate, or drank. My object in being there was an insoluble riddle to them, and for what witchcraft I collected all the stones and insects was an unending source of speculation.

That they entered to some extent into one at least of these interests was proved that very night. I was roused rather late by a deputation, who informed me that they had just discovered a very uncommon object crawling on a stick among the firewood. Going out to the fire, and stirring the embers into a blaze, I was shown one of the most extraordinary insects it has been my lot to look upon. Rather over two inches in length, the creature lay prone upon a branch, adroitly shamming death, after the manner of the *Mantildæ*, to which it obviously belonged. The striking feature was a glittering coal-black spiral, with a large central spot of the same color, painted on the middle of the back; the whole resembling a gigantic eye staring out from the body, and presenting the most vivid contrast to the lemon yellows and greens of the rest of the insect. One naturally sought a mimetic explanation of the singular marking, and I at once recalled a large fringed lichen which covered many of the surrounding trees, and of which this whole insect was a most apt copy. That it was as rare as it was eccentric was evident from the astonishment of the natives, who declared that they had never seen it before.

22nd October.—Water has been scarce for some days, and this morning our one pool was quite dried up, so I struck camp. Marching northwest, over an undulating forest country, we came to a small village, near which was a running stream. The chief, an amiable old gentleman, after an hour spent in suspicious prospecting, came to see the show, and propitiated its leading actor with a present of flour. In return I gave him some cloth and an empty magnesia bottle to hold his snuff. The native snuff-mull is a cylinder of wood profusely carved, and, in the absence of a pocket, hangs tied round the neck with a thong. Snuffing is universal hereabouts.

This is a hotter camp than the last, though the elevation (4500 feet) is nearly the same. Paid the men their fortnight's wage in cloth, and as I threw in an extra fathom they held high revelry till far on in the night.

24th October.—Buffalo fever still on. Sallied forth early with Moolu, a large herd being reported at hand. We struck the trail after a few miles, but the buffaloes had moved

away, passing up a steep valley to the north and clearing a hill. I followed, but saw no sign, and after one or two unsuccessful starts gave it up as the heat had become terrific. Breakfasted off wild honey, which one of the natives managed to lay hands on, and sent for the camp to come up. Moolu went on with one native, T'Shaula—he of the great spear and the black feathers. They returned about two o'clock announcing that they had dropped two bull buffaloes, but not being mortally wounded the quarry had made off. Late in the afternoon two of my men rushed in saying that one of the wounded buffaloes had attacked two of their number, one severely, and that assistance was wanted to carry them back. It seems that five of the men, on hearing Moolu's report about the wounded buffaloes, and tempted by the thought of fresh meat, set off without permission to try to secure them. It was a foolhardy freak, as they had only a spear with them, and a wounded buffalo bull is the most dangerous animal in Africa. It charges blindly at anything, and even after receiving its mortal wound has been known to kill its assailant. The would-be hunters soon overtook one of the creatures, a huge bull, lying in a hollow, and apparently *in articulo mortis*. They calmly walked up to it—the maddest thing in the world—when the brute suddenly roused itself and charged headlong. They ran for their lives; one was overtaken and trampled down in a moment; the second was caught up a few yards farther on and literally impaled on the animal's horns. The first hobbled into camp little the worse, but the latter was brought in half dead. He had two frightful wounds, the less serious on the back behind the shoulder-blade, the other a yawning gash just under the ribs. I fortunately had a little lint and dressed his wounds as well as I could, but I thought he would die in my hands. He was quite delirious, and I ordered a watch all night in case the bleeding should break out afresh. His nurses unhappily could not take in the philosophy of this, and I had to turn out every hour to see that they were not asleep. The native's conception of pain is that it is the work of an evil spirit, and the approved treatment consists in blowing upon the wound and suspending a wooden charm from the patient's neck to exorcise it. All this was duly done now, and the blowing was repeated at frequent intervals through the night.

25th October.—Kacquia conscious, and suffering much. It is impossible to go on, so the men have rigged up a bower for me on the banks of a stream near the camp. Read, wrote, physicked right and left, and received the Chief of Something-or-other. Bribed some of his retinue to search the district for indiarubber, and bring specimens of the trees. After many hours absence they brought me back two freshly-made balls, but neglected to bring a branch, which was what I promised to pay them for. From their description I gather the tree is the Landolphia vine. The method of securing the rubber is to make incisions in the stem and smear the exuding milky juice over their arms and necks. After it has dried a little they scrape it off and roll it up into balls.

An instance of what the native will do for a scrap of meat. Near camp this morning Moolu pointed out to me a gray lump on the top of a very high tree, which he assured me was an animal. It was a kind of lemur, and very good to eat. I had only my Winchester with me, and the ball ripped up the animal, which fell at once, but leaving an ounce or two of viscera on the branch. One of the men, Makata, coming up at the sound of the shot, perceived that the animal was not all there—it had been liter-

ally "cleaned"—immediately started to climb the tree for the remainder. It was a naked stem for a considerable height and thicker than himself, but he attacked it at once native fashion, *i.e.* by *walking* up the trunk, his clasped hands grasping the trunk on the opposite side from his doubled-up body, and literally walking upward on his soles. He soon came down with the precious mess, and in a few minutes it was cooked and eaten.

To-night I thought my hour was come. Our camp was right in the forest; it was pitch dark; and I was sitting late over the smouldering fire with the wounded man. Suddenly a terrific yell rang out from the forest, and a native rushed straight at me brandishing his spear and whooping at the pitch of his voice. Sure that it was an attack, I darted towards the tent for my rifle, and in a second every man in the camp was huddling in it likewise. Some dashed in headlong by the door, others under the canvas, until there was not room to crawl among their bodies. Then followed—nothing. First an awful silence, then a whispering, then a mighty laughter, and then the whole party sneaked out of the fort and yelled with merriment. One of my own men had crept out a few yards for firewood; he had seen a leopard, and lost control of himself—that was all. It is hard to say who was most chaffed about it; but I confess I did not realize before how simple a business it would have been for any one who did not approve of the white man to exterminate him and his caravan.

Sunday, 28th October.—My patient holding on; will now probably pull through. As he has to be fed on liquids, my own fowls have all gone in chicken soup. Fowls are now very scarce, and my men, taking advantage of the high premium and urgent demand, have gone long distances to get them. They will not supply them to the invalid, but sell them to me to give him. Wishing to teach them a lesson in philanthropy, I declined to buy any more on these terms; and after seeing me go three days dinnerless to give Kacquia his chance of life they became ashamed of themselves, and handed me all the fowls they had in a present. This was a prodigious effort for a native, and proves him capable of better things. The whole camp had been watching this byplay for a day or two, and the finish did good all round—more especially as I gave a return present, after a judicious interval, worth five times what had been given me.

Held the usual service in the evening—a piece of very primitive Christianity. Moolu, who had learned much from Dr. Laws, undertook the sermon, and discoursed with great eloquence on the Tower of Babel. The preceding Sunday he had waxed equally warm over the Rich Man and Lazarus; and his description of the Rich Man in terms of native ideas of wealth—"plenty of calico and plenty of beads"—was a thing to remember. "Mission-blacks," in Natal and at the Cape, are a byword among the unsympathetic; but I never saw Moolu do an inconsistent thing. He could neither read nor write; he knew only some dozen words of English; until seven years ago he had never seen a white man; but I could trust him with everything I had. He was not "pious"; he was neither bright nor clever; he was a commonplace black; but he did his duty and never told a lie. The first night of our camp, after all had gone to rest I remember being roused by a low talking. I looked out of my tent; a flood of moonlight lit up the forest; and there, kneeling upon the ground, was a little group of natives, and Moolu in the center conducting evening prayers. Every night afterwards this service was repeated, no matter how long the march was nor how tired the men. I make no comment. But this I will say—Moolu's life gave

him the right to do it. Mission reports are often said to be valueless; they are less so than anti-mission reports. I believe in missions, for one thing, because I believe in Moolu.

But I need not go on with this itinerary. It is very much the same thing over again. For some time yet you must imagine the curious procession I have described wandering hither and thither among the wooded mountains and valleys of the table-land, and going through the same general programme. You might have seen its chief getting browner and browner in the tropical sun, his clothes getting raggeder and raggeder, his collecting-boxes becoming fuller and fuller, and his desire to get home again growing stronger and stronger. Then you might have seen the summer end and the tropical rains begin, and the whole country suddenly clothe itself with living green. And then, as the season advanced, you might have seen him plodding back to the Lake, between the attacks of fever working his way down the Shiré and Zambesi, and so, after many days, greeting the new spring in England.

VI.

THE WHITE ANT.

A THEORY.

A FEW years ago, under the distinguished patronage of Mr. Darwin, the animal in vogue with scientific society was the worm. At present the fashionable animal is the ant. I am sorry, therefore, to have to begin by confessing that the insect whose praises I propose to sing, although bearing the honored name, is not entitled to consideration on account of its fashionable connections, since the white ant, as an ant, is an impostor. It is, in fact, not an ant at all, but belongs to a much humbler family—that of the *Termitidæ*—and so far from ever having been the vogue, this clever but artful creature is hated and despised by all civilized peoples. Nevertheless, if I mistake not, there is neither among the true ants, nor among the worms, an insect which plays a more wonderful or important part in nature.

Fully to appreciate the beauty of this function, a glance at an apparently distant aspect of nature will be necessary as a preliminary.

When we watch the farmer at work, and think how he has to plough, harrow, manure, and humor the soil before even one good crop can be coaxed out of it, we are apt to wonder how nature manages to secure her crops and yet dispense with all these accessories. The world is one vast garden, bringing forth crops of the most luxuriant and varied kind century after century, and millennium after millennium. Yet the face of nature is nowhere furrowed by the plough, no harrow disintegrates the clods, no lime and phosphates are strewn upon its fields, no visible tillage of the soil improves the work on the great world's farm.

Now, in reality, there cannot be crops, or successions of crops, without the most thorough agriculture: and when we look more closely into nature we discover a system of husbandry of the most surprising kind. Nature does all things unobtrusively; and it is only now that we are beginning to see the magnitude of these secret agricultural operations by which she does already all that man would wish to imitate, and to which his most scientific methods are but clumsy approximations.

In this great system of natural husbandry nature uses agencies, implements, and tools of many kinds. There is the disintegrating frost, that great, natural harrow, which bursts asunder the clouds by the expansion during freezing of the moisture imprisoned in their pores. There is the communistic wind

which scatters broadcast over the fields the finer soil in clouds of summer dust. There is the rain which washes the humus into the hollows and scrapes bare the rocks for further denudation. There is the air which, with its carbonic acid and oxygen, dissolves and decomposes the stubborn hills, and manufactures out of them the sofest soils of the valley. And there are the humic acids, generated through decay, which filter through the ground and manure and enrich the new made soils.

But this is not all, nor is this enough ; to prepare a surface film, however rich, and to manure the soil beneath, will secure one crop, but not a succession of crops. There must be a mixture and transference, of these layers, and a continued mixture and transference. kept up from age to age. The lower layer of soil, exhausted with bringing forth, must be transferred to the top for change of air, and there it must lie for a long time, increasing its substance, and recruiting its strength among the invigorating elements. The upper film, restored, disintegrated, saturated with fertility and strength, must next be slowly lowered down again to where the rootlets are lying in wait for it, deep in the under soil.

Now how is this last change brought about? Man turns up the crust with the plough, throwing up the exhausted earth, down the refreshed soil, with infinite toil and patience. And nature does it by natural ploughmen who, with equal industry, are busy all over the world reversing the earth's crust, turning it over and over from year to year, only much more slowly and much more thoroughly, spadeful by spadeful, foot by foot, and even grain by grain. Before Adam delved the Garden of Eden these natural agriculturists were at work, millions and millons of them in every part of the globe at different seasons and in different ways, tilling the world's fields.

According to Mr. Darwin, the animal which performs this most important function in nature is the earthworm. The marvellous series of observations by which the great naturalist substantiated his conclusions are too well known for repetition. Mr. Darwin calculates that on every acre of land in England more then ten tons of dry earth are passed through the bodies of worms and brought to the surface every year ; and he assures us that the whole soil of the country must pass and repass through their bodies every few years. Some of this earth is brought up from a considerable depth beneath the soil, for, in order to make its subterranean burrow, the animal is compelled to swallow a certain quantity of earth. It eats its way, in fact, to the surface, and there voids the material in a little heap. Although the proper diet of worms is decaying vegetable matter, dragged down from the surface in the form of leaves and tissues of plants, there are many occasions on which this source of aliment falls, and the animal has then to nourish itself by swallowing quantities of earth, for the sake of the organic substances it contains. In this way the worm has a twofold inducement to throw up earth. First, to dispose of the material excavated from its burrow ; and second, to obtain adequate nourishment in times of famine. "When we behold a wide, turf-covered expanse," says Mr. Darwin, "we should remember that its smoothness, on which so much of its beauty depends, is mainly due to all the inequalities having been slowly levelled by worms. It is a marvellous reflection that the whole of the superficial mould over any such expanse has passed, and will again pass, every few years, through the bodies of worms. The plough is one of the most ancient and most valuable of man's inventions ; but long before he existed the land was, in fact, regularly ploughed by earth-

worms. It may be doubted whether there are any other animals which have played so important a part in the history of the world as have these lowly organized creatures."*

Now without denying the very important contribution of the earthworm in this respect, a truth sufficiently endorsed by the fact that the most circumstantial of naturalists has devoted a whole book to this one animal, I would humbly bring forward another claimant to the honor of being, along with the worm, the agriculturist of nature. While admitting to the fullest extent the influence of worms in countries which enjoy a temperate and humid climate, it can scarcely be allowed that the same influence is exerted, or can possibly be exerted, in tropical lands. No man was less in danger of taking a provincial view of nature than Mr. Darwin, and in discussing the earthworm he has certainly collected evidence from different parts of the globe. He refers, although sparingly, and with less than his usual wealth of authorities, to worms being found in Iceland, in Madagascar, in the United States, Brazil, New South Wales, India, and Ceylon. But his facts, with regard especially to the influence, on the large scale, of the worm in warm countries, are few or wholly wanting. Africa, for instance, the most tropical country in the world, is not referred to at all; and where the activities of worms in the tropics are described, the force of the fact is modified by the statement that these are only exerted during the limited number of weeks of the rainy season.

The fact is, for the greater portion of the year in the tropics the worm cannot operate at all. The soil, baked into a brick by the burning sun, absolutely refuses a passage to this soft and delicate animal. All the members of the earthworm tribe, it is true, are natural skewers, and though boring is their supreme function, the substance of these skewers is not hardened iron, and the pavement of a tropical forest is quite as intractable for nine months in the year as are the frost-bound fields to the farmer's ploughshare. During the brief period of the rainy season worms undoubtedly carry on their function in some of the moister tropical districts; and in the sub-tropical regions of South America and India, worms, small and large, appear with the rains in endless numbers. But on the whole the tropics proper seem to be poorly supplied with worms. In Central Africa, though I looked for them often, I never saw a single worm. Even when the rainy season set in, the closest search failed to reveal any trace either of them or of their casts. Nevertheless, so wide is the distribution of this animal, that in the moister regions even of the equatorial belt one should certainly expect to find it. But the general fact remains. Whether we consider the comparative poorness of their development, or the limited period during which they can operate, the sustained performance of the agricultural function by worms, over large areas in tropical countries, is impossible.

Now as this agricultural function can never be dispensed with, it is more than probable that nature will have there commissioned some other animal to undertake the task. And there are several other animals to whom this difficult and laborious duty might be entrusted. There is the mole, for instance, with its wonderful spade-like feet, that natural navvy, who shovels the soil about so vigorously at home; but against the burnt crust of the tropics even this most determined of burrowers would surely turn the edge of his nails. The same remark applies to those curious little geologists the marmots and skipmunks, which one sees throwing up their tiny heaps of sand and gravel on the American prairies. And though the torrid zone boasts

* *Vegtable Mould and Earth Worms*, p 313.

of a strong-limbed and almost steel-shod creature, the ant-bear, his ravages are limited to the destruction of the nests of ants; and however much this somewhat scarce animal contributes to the result, we must look in another direction for the true tropical analogue of the worm.

The animal we are in search of, and which I venture to think equal to all the necessities of the case, is the termite or white ant. It is a small insect, with a bloated, yellowish-white body, and a somewhat large thorax, oblong-shaped, and colored a disagreeable oily brown. The flabby, tallow-like body makes this insect sufficiently repulsive, but it is for quite another reason that the white ant is the worst abused of all living vermin in warm countries. The termite lives almost exclusively upon wood; and the moment a tree is cut or a log sawn for any economical purpose, this insect is upon its track. One may never see the insect, possibly, in the flesh, for it lives underground; but its ravages confront one at every turn. You build your house, perhaps, and for a few months fancy you have pitched upon the one solitary site in the country where there are no white ants. But one day suddenly the door-post totters, and lintel and rafters come down together with a crash. You look at a section of the wrecked timbers, and discover that the whole inside is eaten clean away. The apparently solid logs of which the rest of the house is built are now mere cylinders of bark, and through the thickest of them you could push your little finger. Furniture, tables, chairs, chests of drawers, everything made of wood, is inevitably attacked, and in a single night a strong trunk is often riddled through and through, and turned into matchwood. There is no limit, in fact, to the depredation by these insects, and they will eat books, or leather, or cloth, or anything; and in many parts of Africa I believe if a man lay down to sleep with a wooden leg it would be a heap of sawdust in the morning. So much feared is this insect now, that no one in certain parts of India and Africa ever attempts to travel with such a thing as a wooden trunk. On the Tanganyika plateau I have camped on ground which was as hard as adamant, and as innocent of white ants apparently as the pavement of St. Paul's, and wakened next morning to find a stout wooden box almost gnawed to pieces. Leather portmanteaus share the same fate, and the only substances which seem to defy the marauders are iron and tin.

But what has this to do with earth or with agriculture? The most important point in the work of the white ant remains to be noted. I have already said that the white ant is never seen. Why he should have such a repugnance to being looked at is at first sight a mystery, seeing that he himself is stone blind. But his coyness is really due to the desire for self-protection, for the moment his juicy body shows itself above ground there are a dozen enemies waiting to devour it. And yet the white ant can never procure any food until it comes above ground. Nor will it meet the case for the insect to come to the surface under the shadow of night. Night in the tropics, so far as animal life is concerned, is as the day. It is the great feeding time, the great fighting time, the carnival of the carnivores, and of all beasts, birds, and insects of prey from the least to the greatest. It is clear then that darkness is no protection to the white ant; and yet without coming out of the ground it cannot live. How does it solve the difficulty? It takes the ground out along with it. I have seen white ants working on the top of a high tree, and yet they were under-ground. They took up some of the ground with them to the tree-top; just as the Esquimaux heap up snow, building it into the

low tunnel-huts in which they live, so the white ants collect earth, only in this case not from the surface but from some depth underneath the ground, and plaster it into tunnelled ways. Occasionally these run along the ground, but more often mount in endless ramifications to the top of trees, meandering along every branch and twig, and here and there debouching into large covered chambers which occupy half the girth of the trunk. Millions of trees in some districts are thus fantastically plastered over with tubes, galleries, and chambers of earth, and many pounds weight of subsoil must be brought up for the mining of even a single tree. The building material is conveyed by the insects up a central pipe with which all the galleries communicate, and which at the downward end connects with a series of subterranean passages leading deep into the earth. The method of building the tunnels and covered ways is as follows :—At the foot of a tree the tiniest hole cautiously opens in the ground close to the bark. A small head appears with a grain of earth clasped in its jaws. Against the tree-trunk this earth-grain is deposited, and the head is withdrawn. Presently it reappears with another grain of earth, this is laid beside the first, rammed tight against it, and again the builder descends underground for more. The third grain is not placed against the tree, but against the former grain; a fourth, a fifth, and a sixth follow, and the plan of the foundation begins to suggest itself as soon as these are in position. The stones or grains or pellets of earth are arranged in a semicircular wall, the termite, now assisted by three or four others, standing in the middle between the sheltering wall and the tree, and working briskly with head and mandible to strengthen the position. The wall in fact forms a small moon-rampart, and as it grows higher and higher it soon becomes evident that it is going to grow from a low battlement into a long perpendicular tunnel running up the side of the tree. The workers, safely ensconced inside, are now carrying up the structure with great rapidity, disappearing in turn as soon as they have laid their stone and rushing off to bring up another. The way in which the building is done is extremely curious, and one could watch the movement of these wonderful little masons by the hour. Each stone as it is brought to the top is first of all covered with mortar. Of course, without this the whole tunnel would crumble into dust before reaching the height of half an inch; but the termite pours over the stone a moist sticky secretion, turning the grain round and round with its mandibles until the whole is covered with slime. Then it places the stone with great care upon the top of the wall, works it about vigorously for a moment or two till it is well jammed into its place, and then starts off instantly for another load.

Peering over the growing wall, one soon discovers one, two, or more termites of a somewhat larger build, considerably longer, and with a very different arrangement of the parts of the head, and especially of the mandibles. These important-looking individuals saunter about the rampart in the most leisurely way, but yet with a certain air of business, as if perhaps the one was the master of works and the other the architect. But closer observation suggests that they are in no wise superintending operations, nor in any immediate way contributing to the structure, for they take not the slightest notice either of the workers or the works. They are posted there in fact as sentries, and there they stand, or promenade about, at the mouth of every tunnel, like sister Ann, to see if anybody is coming. Sometimes somebody does come in the shape of another ant—the real ant this time, not the defenseless *Neuropteron*, but some

valiant and belted knight from the warlike *Formicidæ*. Singly, or in troops, this rapacious little insect, fearless in its chitinous coat of mail, charges down the tree-trunk, its antennæ waving defiance to the enemy, and its cruel mandibles thirsting for termite blood. The worker white ant is a poor defenceless creature, and, blind and unarmed, would fall an immediate prey to these well-drilled banditti, who forage about in every tropical forest in unnumbered legion. But at the critical moment, like Goliath from the Philistines, the soldier termite advances to the fight. With a few sweeps of its scythe-like jaws it clears the ground, and while the attacking party is carrying off its dead, the builders, unconscious of the fray, quietly continue their work. To every hundred workers in a white ant colony, which numbers many thousands of individuals, there are perhaps two of these fighting men. The division of labor here is very wonderful, and the fact that besides these two specialized forms there are in every nest two other kinds of the same insect, the kings and queens, shows the remarkable height to which civilization in these communities has attained.

But where is this tunnel going to, and what object have the insects in view in ascending this lofty tree? Thirty feet from the ground, across innumerable forks, at the end of a long branch, are a few feet of dead wood. How the ants know it is there, how they know its sap has dried up, and that it is now fit for the termites' food, is a mystery. Possibly they do not know, and are only prospecting on the chance. The fact that they sometimes make straight for the decaying limb argues in these instances a kind of definite instinct; but on the other hand, the fact that in most cases the whole tree, in every branch and limb, is covered with termite tunnels, would show perhaps that they work most commonly on speculation, while the number of abandoned tunnels, ending on a sound branch in a *cul de sac*, proves how often they must suffer the usual disappointments of all such adventurers. The extent to which these insects carry on their tunneling is quite incredible until one has seen it in nature with his own eyes. The tunnels are perhaps about the thickness of a small-sized gas-pipe, but there are junctions here and there of large dimensions, and occasionally patches of earthwork are found embracing nearly the whole trunk for some feet. The outside of these tunnels, which are never quite straight, but wander irregularly along stem and branch, resembles in texture a coarse sand-paper; and the color, although this naturally varies with the soil, is usually a reddish brown. The quality of earth and mud plastered over a single tree is often enormous; and when one thinks that it is not only an isolated specimen here and there that is frescoed in this way, but often the whole of the trees of a forest, some idea will be formed of the magnitude of the operations of these insects and the extent of their influence upon the soil which they are thus ceaselessly transporting from underneath the ground.

In travelling through the great forests of the Rocky Mountains or of the Western States, the broken branches and fallen trunks strewing the ground breast-high with all sorts of decaying litter frequently make locomotion impossible. To attempt to ride through these western forests, with their mesh-work of interlocked branches and decaying trunks, is often out of the question, and one has to dismount and drag his horse after him as if he were clambering through a woodyard. But in an African forest not a fallen branch is seen. One is struck at first at a certain clean look about the great forests of the interior, a novel and unaccountable cleanness, as if the forest-bed was carefully swept and dusted daily by unseen elves. And

so, indeed, it is. Scavengers of a hundred kinds remove decaying animal matter—from the carcase of a fallen elephant to the broken wing of a gnat—eating it, or carrying it out of sight, and burying it on the deodorizing earth. And these countless millions of termites perform a similar function for the vegetable world, making away with all plants and trees, all stems, twigs, and tissues, the moment the finger of decay strikes the signal. Constantly in these woods one comes across what appear to be sticks and branches and bundles of faggots, but when closely examined they are seen to be mere casts in mud. From these hollow tubes, which preserve the original form of the branch down to the minutest knot or fork, the ligneous tissue is often entirely removed, while others are met with in all stages of demolition. The insects start apparently from two centres. One company attacks the inner bark, which is the favorite morsel, leaving the coarse outer bark untouched, or more usually replacing it with grains of earth, atom by atom, as they eat it away. The inner bark is gnawed off likewise as they go along, but the woody tissue beneath is allowed to remain to form a protective sheath for the second company who begin work at the centre. This second contingent eats its way outward and onward, leaving a thin tube of the outer wood to the last, as props to the mine, till they have finished the main excavation. When a fallen trunk lying upon the ground is the object of attack, the outer cylinder is frequently left quite intact, and it is only when one tries to drag it off to his campfire that he finds to his disgust that he is dealing with a mere hollow tube a few lines in thickness filled up with mud.

But the works above ground represent only a part of the labours of these slow-moving but most industrious of creatures. The arboreal tubes are only the prolongation of a much more elaborate system of subterranean tunnels, which extend over large areas and mine the earth sometimes to a depth of many feet or even yards.

The material excavated from these underground galleries and from the succession of domed chambers—used as nurseries or granaries—to which they lead, has to be thrown out upon the surface. And it is from these materials that the huge ant-hills are reared, which form so distinctive a feature of the African landscape. These heaps and mounds are conspicuous that they may be seen for miles, and so numerous are they and so useful as cover to the sportsman, that without them in certain districts hunting would be impossible. The first things, indeed, to strike the traveller in entering the interior are the mounds of the white ant, now dotting the plain in groups like a small cemetery, now rising into mounds, singly or in clusters, each thirty or forty feet in diameter and ten or fifteen feet in height; or, again, standing out against the sky like obelisks, their bare sides carved and fluted into all sorts of fantastic shapes. In India these ant-heaps seldom attain a height of more than a couple of feet, but in Central Africa they form veritable hills, and contain many tons of earth. The brick houses of the Scotch mission-station on Lake Nyassa have all been built out of a single ants' nest, and the quarry from which the material has been derived forms a pit beside the settlement some dozen feet in depth. A supply of bricks, as large again, could probably still be taken from this convenient depôt; and the missionaries on Lake Tanganyika and onwards to Victoria Nyanza have been similarly indebted to the labors of the termites. In South Africa the Zulus and Kaffirs pave all their huts with white ant earth; and during the Boer war our troops in Praetoria, by scooping out the interior from the smaller beehive-shaped ant-heaps, and covering the top with clay, con-

stantly used them as ovens. These ant-heaps may be said to abound over the whole interior of Africa, and there are several distinct species. The most peculiar, as well as the most ornate, is a small variety from one to two feet in height, which occurs in myriads along the shores of Lake Tanganyika. It is built in symmetrical tiers, and resembles a pile of small rounded hats, one above another, the rims depending like eaves, and sheltering the body of the hill from rain. To estimate the amount of earth per acre raised from the water-line of the subsoil by white ants would not in some districts be an impossible task; and it would be found, probably, that the quantity at least equalled that manipulated annually in temperate regions by the earthworm.

These mounds, however, are more than mere waste-heaps. Like the corresponding region under-ground, they are built into a meshwork of tunnels, galleries, and chambers, where the social interests of the community are attended to. The most spacious of these chambers, usually far underground, is very properly allocated to the head of the society, the queen.—The queen-termite is a very rare insect, and as there are seldom more than one, or at most two, to a colony, and as the royal apartments are hidden far in the earth, few persons have ever seen a queen, and indeed most, if they did happen to come across it, from its very singular appearance, would refuse to believe that it had any connection with white ants. It possesses, indeed, the true termite head, but there the resemblance to the other members of the family stops, for the size of the head bears about the same proportion to the rest of the body as does the tuft on his Glengarry bonnet to a six-foot Highlander. The phenomenal corpulence of the royal body in the case of the queen-termite is possibly due in part, to want of exercise, for once seated upon her throne she never stirs to the end of her days. She lies there, a large, loathsome, cylindrical package, two or three inches long, in shape like a sausage, and as white as a bolster. Her one duty in life is to lay eggs, and it must be confessed she discharges her function with complete success, for in a single day her progeny often amounts to many thousands, and for months this enormous fecundity never slackens. The body increases slowly in size, and through the transparent skin the long folded ovary may be seen, with the eggs, impelled by a peristaltic motion, passing onward for delivery to the workers who are waiting to carry them to the nurseries where they are hatched. Assiduous attention, meantime, is paid to the queen by other workers, who feed her diligently, with much self-denial stuffing her with morsel after morsel from their own jaws. A guard of honor in the shape of a few of the larger soldier-ants is also in attendance as a last and almost unnecessary precaution. In addition, finally, to the soldiers, workers, and queen, the royal chamber has also one other inmate—the king. He is a very ordinary-looking insect, about the same size as the soldiers, but the arrangement of the parts of the head and body is widely different, and like the queen he is furnished with eyes.

Let me now attempt to show the way in which the work of the termites bears upon the natural agriculture and geology of the tropics. Looking at the question from the large point of view, the general fact to be noted is, that the soil of the tropics is in a state of perpetual motion. Instead of an upper crust, moistened to a paste by the autumn rains, and then baked hard as adamant in the sun; and an under soil, hermetically sealed from the air and light, and inaccessible to all the natural manures derived from the decomposition of organic matters—these two lawyers being eternally fixed in their relation to one another—we have a slow and continued transference of the layers always tak-

ing place. Not only to cover their depredations, but to dispose of the earth excavated from the underground galleries, the termites are constantly transporting the deeper and exhausted soils to the surface. Thus there is, so to speak, a constant circulation of earth in the tropics, a ploughing and harrowing, not furrow by furrow and clod by clod, but pellet by pellet and grain by grain.

Some idea of the extent to which the underlying earth of the tropical forests is thus brought to the surface will have been gathered from the facts already described; but no one who has not seen it with his own eyes can appreciate the gigantic magnitude of the process. Occasionally one sees a whole trunk or branch, and sometimes almost an entire tree, so swathed in red mud that the bark is almost completely concealed, the tree looking as if it had been taken out bodily and dipped in some crystallizing solution. It is not only one tree here and there that exhibits the work of the white ant, but in many places the whole forest is so colored with dull red tunnels and patches as to give a distinct tone to the landscape—an effect which, at a little distance, reminds one of the *abendroth* in a pine forest among the Alps. Some regions are naturally more favorable than others to the operations of the termites, and to those who have only seen them at work in India or in the lower districts of Africa this statement may seem an exaggeration. But on one range of forest-clad hills on the great plateau between Lake Nyassa and Tanganyika I have walked for miles through trees, every one of which, without exception, was ramified, more or less, with tunnels. The elevation of this locality was about 5000 feet above the sea, and the distance from the equator some 9°; but nowhere else have I seen a spot where the termites were so completely masters of the situation as here. If it is the case that in these, the most elevated regions of Central Africa, the termite colonies attain their maximum development, the fact is of much interest in connection with the geological and agricultural function which they seem to serve: for it is here precisely, before the rivers have gathered volume, that alluvium is most wanting; it is here that the tiny headwaters of these same rivers collect the earth for subsequent distribution over the distant plains and coasts; and though the white ant may itself have no power, in the first instance, of creating soil, as a denuding and transporting agent its ministry can scarcely be exaggerated. If this is its function in the economy of nature, it is certainly clear that the insect to which this task is assigned is planted where, of all places, it can most effectively fulfil the end.

The direct relation of the termites' work to denudation will still further appear if we try to imagine the effect upon these accumulations of earth-pellets and grains of an ordinary rainy season. For two or three months in the tropics, though intermittently, the rains lash the forests and soils with a fury such as we, fortunately, have little idea of. And though the earthworks, and especially the larger ant-hills, have marvellous resisting properties, they are not invulnerable, and must ultimately succumb to denuding agents. The tunnels, being only required for a temporary purpose, are made substantial enough only to last the occasion. And in spite of the natural glue which cements the pellets of earth together, the structure, as a whole, after a little exposure, becomes extremely friable, and crumbles to pieces at a touch. When the earth-tubes crumble into dust in the summer season the débris is scattered over the country by the wind, and in this way tends to increase and refresh the soil. During the rains, again, it is washed into the rivulets and borne away to fertilize with new alluvium the distant val-

leys, or carried downward to the ocean, where, along the coast line, it "sows the dust of continents to be." Herodotus, with equal poetic and scientific truth, describes Egypt as "the gift of the Nile." Possibly had he lived to-day he might have carried his vision farther back still, and referred some of it to the labors of the humble termites in the forest slopes about Victoria Nyanza.

VII.

MIMICRY.

THE WAYS OF AFRICAN INSECTS.

Mimicry is imposture in nature. Carlyle in his blackest visions of "shams and humbugs" among human kind never saw anything so finished in hypocrisy as the naturalist now finds in every tropical forest. There are to be seen creatures, not singly, but in tens of thousands, whose very appearance, down to the minutest spot and wrinkle, is an affront to truth, whose every attitude is a *pose* for a purpose, and whose whole life is a sustained lie. Before these masterpieces of deception the most ingenious of human impositions are vulgar and transparent. Fraud is not only the great rule of life in a tropical forest, but the one condition of it.

Although the extraordinary phenomena of mimicry are now pretty generally known to science, few workers have yet had the opportunity of studying them in nature. But no study in natural history depends more upon observation in the field; for while in the case of a few mimetic forms—the *Heliconidæ*, for example—the imitated form is also an insect, and the two specimens may be laid side by side in the cabinet at home, the great majority of mimetic insects are imitations of objects in the environment which cannot be brought into comparison with them in the drawers of a museum. Besides this, it is not only the form but the behavior of the mimetic insect, its whole habit and habitat, that have to be considered; so that mere museum contributions to mimicry are almost useless without the amplest supplement from the field naturalist. I make no further apology, therefore, for transcribing here a few notes bearing upon this subject from journals written during a recent survey of a region in the heart of Africa — the Nyassa-Tanganyika plateau—which has not yet been described or visited by any naturalist.

The preliminaries of the subject can be mastered in a moment even by the uninitiated, and I may therefore begin with a short preface on animal coloring in general. Mimicry depends on resemblances between an animal and some other object in its environment of which it is a practical gain to the creature to be a more or less accurate copy. The resemblance may be to any object, animate or inanimate. It may be restricted to color, or it may extend to form, and even to habit; but of these the first is by far the most important.

Apart from sexual selection, color in animals mainly serves two functions. It is either "protective" or "warning." The object of the first is to render the animal inconspicuous, the object of the second is the opposite—to make it conspicuous. Why it should be an object with some animals to be palpably exposed will be apparent from the following familiar instance of "warning" coloration. There are two great families of butterflies, the *Danaidæ* and *Acraïedæ*, which are inedible owing to the presence in their bodies of acrid and unwholesome juices. Now to swallow one of these creatures—and birds, monkeys, lizards, and spiders are very fond of butterflies—would be gratuitous. It would be disappointing to the eater, who would have to disgorge his prey immedi-

ately, and it would be an unnecessary sacrifice of the subject of the experiment. These butterflies, therefore, must have their disagreeableness in some way advertised, and so they dress up with exceptional eccentricity, distinguishing themselves by loud patterns and brilliant colorings, so that the bird, the monkey, and the rest can take in the situation at a glance. These animated danger-signals float serenely about the forests wtth the utmost coolness in the broadest daylight, leisureliness, defiance, and self-complacency marking their every movement, while their duskier brethren have to hurry through the glades in terror of their lives. For the same reason, well-armed or stinging insects are always conspicuously ornamented with warning colors. The expense of eating a wasp, for instance, is too great to lead to a second investment in the same insect, and wasps therefore have been rendered as showy as possible so that they may be at once seen and as carefully avoided. The same law applies to bees, dragonflies, and other gaudy forms ; and it may be taken as a rule that all gaily-colored insects belong to one or other of these two classes : that is, that they are either bad eating or bad-stingers. Now the remarkable fact is that all these brilliant and unwholesome creatures are closely imitated in outward apparel by other creatures not themselves protected by acrid juices, but which thus share the same immunity. That these are cases of mimicry is certain from many considerations, not the least striking of which is that frequently one of the sexes is protectively colored and not the other.

The brilliant coloring of poisonous snakes is sometimes set down by naturalists to "warning," but the details of coloring among reptiles have never been thoroughly worked out. The difficulty suggests itself that if the vivid yellows and oranges of some snakes are meant to warn off dangerous animals, the same conspicuousness would warn off the animals on which the venomous forms prey. Thus, while *being* hunted, a showy skin might be of advantage to the snake ; in hunting it would be an equal disadvantage. But when one watches on the spot the manner in which snakes really do their hunting, it becomes probable that the coloring, vivid and peculiar as it is, in most cases is designed simply to aid concealment. One of the most beautiful and ornate of all the tropical reptiles is the puff-adder. This animal, the bite of which is certain death, is from three to five feet long, and disproportionately thick, being in some parts almost as thick as the lower part of the thigh. The whole body is ornamented with strange devices in green, yellow, and black, and lying in a museum its glittering coils certainly form a most striking object. But in nature the puff-adder has a very different background. It is essentially a forest animal, its true habitat being among the fallen leaves in the deep shade of the trees by the banks of streams. Now in such a position, at the distance of a foot or two, its appearance so exactly resembles the forest bed as to be almost indistinguishable from it. I was once just throwing myself down under a tree to rest when, stooping to clear the spot, I noticed a peculiar pattern among the leaves. I started back in horror to find a puff-adder of the largest size, its thick back only visible and its fangs within a few inches of my face as I stooped. It was lying concealed among fallen leaves so like itself that, but for the exceptional caution which in African travel becomes a habit, I should certainly have sat down upon it, and to sit down upon a puff-adder is to sit down for the last time. I think this coloration in the puff-adder is more than that of warning, and that this semi-somnolent attitude is not always the mere attitude of repose. This reptile lay lengthwise, concealed, all but a few inches, among the

withered leaves. Now the peculiarity of the puff-adder is that it strikes *backward*. Lying on the ground, therefore, it commands as it were its whole rear, and the moment any part is touched, the head doubles backward with inconceivable swiftness, and the poison-fangs close upon their victim. The puff-adder in this way forms a sort of horrid trap set in the woods which may be altogether unperceived till it shuts with a sudden spring upon its prey.

But that the main function of coloring is protection may be decided from the simplest observation of animal life in any part of the world. Even among the larger animals, which one might suppose independent of subterfuge and whose appearance anywhere but in their native haunts suggests a very opposite theory, the harmony of color with environment is always more or less striking. When we look, for instance, at the coat of a zebra with its thunder-and-lightning pattern of black and white stripes, we should think such a conspicuous object designed to court rather than to elude attention. But the effect in nature is just the opposite. The black and white somehow take away the sense of a solid body altogether ; the two colors seem to blend into the most inconspicuous gray, and at close quarters the effect is as of bars of light seen through the branches of shrubs. I have found myself in the forest gazing at what I supposed to be a solitary zebra, its presence betrayed by some motion due to my approach, and suddenly realized that I was surrounded by an entire herd which were all invisible until they moved. The motionlessness of wild game in the field when danger is near is well known ; and every hunter is aware of the difficulty of seeing even the largest animals though they are just standing in front of him. The tiger, whose stripes are obviously meant to imitate the reeds of the jungle in which it lurks, is nowhere found in Africa ; but its beautiful cousin, the leopard, abounds in these forests, and its spotted pelt probably conveys the same sense of indistinctness as in the case of the zebra. The hippopotamus seems to find the deep water of the rivers—where it spends the greater portion of its time—a sufficient protection ; but the crocodile is marvellously concealed by its knotted mud-colored hide, and it is often quite impossible to tell at a distance whether the objects lying along the river banks are alligators or fallen logs.

But by far the most wonderful examples of protective adjustments are found where the further disguise of form is added to that of color, and to this only is the term mimicry strictly applicable. The pitch of intricate perfection to which mimicry has attained in an undisturbed and unglaciated country like Central Africa is so marvellous and incredible, that one almost hesitates to utter what his eyes have seen. Before going to Africa I was of course familiar with the accounts of mimetic insects to be found in the works of Bates, Belt, Wallace, and other naturalists ; but no description prepares one in the least for the surprise which awaits him when first he encounters these species in nature. My introduction to them occurred on the borders of Lake Shirwa—one of the smaller and less known of the great African lakes —and I shall record the incident exactly as I find it in my notes. I had stopped one day among some tall dry grass to mark a reading of the aneroid, when one of my men suddenly shouted "Chirombo !" "Chirombo" means an inedible beast of any kind, and I turned round to see where the animal was. The native pointed straight at myself. I could see nothing, but he approached, and pointing close to a wisp of hay which had fallen upon my coat, repeated "Chirombo!" Believing that it must be some insect among the hay, I took it in my fingers, looked over it, and told him pointedly

there was no "Chirombo" there. He smiled, and pointing again to the hay, exclaimed "Moio!" - "It's alive!" The hay itself was the Chirombo. I do not exaggerate when I say that that wisp of hay was no more like an insect than my aneroid barometer. I had mentally resolved never to be taken in by any of these mimetic frauds; I was incredulous enough to suspect that the descriptions of Wallace and the others were somewhat highly colored; but I confess to have been completely stultified and beaten by the very first mimetic form I met. It was one of that very remarkable family the *Phasmidæ*, but surely nowhere else in nature could there be such another creature. Take two inches of dried yellow grass-stalk, such as one might pluck to run through the stem of a pipe; then take six other pieces nearly as long and a quarter as thick; bend each in the middle at any angle you like, stick them in three opposite pairs, and again at any angle you like, upon the first grass stalk, and you have my Chirombo. When you catch him, his limbs are twisted about at every angle, as if the whole were made of one long stalk of the most delicate grass, hinged in a dozen places, and then gently crushed up into a dishevelled heap. Having once assumed a position, by a wonderful instinct he never moves or varies one of his many angles by half a degree. The way this insect keeps up the delusion is indeed almost as wonderful as the mimicry itself; you may turn him about and over and over, but he is mere dried grass, and nothing will induce him to acknowledge the animal kingdom by the faintest suspicion of spontaneous movement. All the members of this family have this power of shamming death; but how such emaciated and juiceless skeletons should ever presume to be alive is the real mystery. These *Phasmidæ* look more like ghosts than living creatures, and so slim are they that, in trying to kill them for the collecting-box, the strongest squeeze between finger and thumb makes no more impression upon them than it would upon fine steel wire, and one has to half-guillotine them against some hard substance before any little life they have is sacrificed to science.

I examined after this many thousands of Phasmidæ, Mantidæ, and other mimetic forms, and there is certainly in nature no more curious or interesting study. These grass-stalk insects live exclusively among the long grass which occurs in patches all over the forests, and often reaches a height of eight or ten feet. During three-fourths of the year it is dried by the sun into a straw-yellow color, and all the insects are painted to match. Although yellow is the ground tone of these grasses, they are variegated, and especially towards the latter half of the year, in two ways. They are either tinged here and there with red and brown, like the autumn colors at home, or they are streaked and spotted with black mould or other markings, painted by the finger of decay. All these appearances are closely imitated by insects. To complete the deception, some have the antennæ developed to represent blades of grass, which are often from one to two inches in length, and stick out from the end of the body, one on either side, like blades of grass at the end of a stalk. The favorite attitude of these insects is to clasp a grass-stalk, as if they were climbing a pole; then the body is compressed against the stem and held in position by the two fore-limbs, which are extended in front so as to form one long line with the body, and so mixed up with the stalk as to be practically part of it. The four other legs stand out anyhow in rigid spikes, like forks from the grass, while the antennæ are erected at the top, like blades coming off from a node, which the button-like head so well resembles. When one of these in-

sects springs to a new stalk of grass it will at once all but vanish before your eyes. It remains there perfectly rigid, a component part of the grass itself, its long legs crooked and branched exactly like dried hay, the same in color, the same in fineness, and quite defying detection. These blades, alike with limbs and body, are variously colored according to season and habitat. When the grasses are tinged with autumn tints they are the same; and the colors run through many shades, from the pure bright red, such as tips the fins of a perch, to the deeper claret colors or the tawny gold of port. But an even more singular fact remains to be noted. After the rainy season, when the new grasses spring up with their vivid color, these withered-grass insects seem all to disappear. Their color now would be no protection to them, and their places are taken by others colored as green as the new grass. Whether these are new insects or only the same in spring toilets I do not know, bnt I should think they are a different population altogether, the cycle of the former generation being, probably, complete with the end of summer.

Besides the insects which imitate grass, another large class imitate twigs, sticks, and the smaller branches of shrubs. The commonest of these is a walking twig, three or four inches long, covered with bark apparently, and, spotted all over with mould like the genuine branch. The imitation of bark here is one of the most perfect delusions in nature; the delicate striation and the mould spots are reproduced exactly, while the segmentation of the body represents node-intervals with wonderful accuracy. On finding one of these insects I have often cut a small branch from an adjoining tree and laid the two side by side for comparison; and when both are partly concealed by the hands so as to show only the part of the insect's body which is free from limbs, it is impossible to tell the one from the other. The very joints of the legs in these forms are knobbed to represent nodes, and the characteristic attitudes of the insect are all such as to sustain the deception.

A still more elaborate set of forms are those which represent leaves. These belong mostly to the Mantis and Locust tribes, and they are found in all forms, sizes, and colors, mimicking foliage at every stage of growth, maturity, and decay. Some have the leaf stamped on their broadened wing-cases in vivid green, with veins and midrib complete, and with curious expansions over the thorax and along all the limbs to imitate smaller leaves. I have again and again matched these forms in the forest, not only with the living leaf, but with crumpled, discolored, and shrivelled specimens, and indeed the imitations of the crumpled autumn-leaf are even more numerous and impressive than those of the living form. Lichens, mosses, and fungi are also constantly taken as models by insects, and there is probably nothing in the vegetable kingdom, no knot, wart, nut, mould, scale, bract, thorn, or bark, which has not its living counterpart in some animal form. Most of the moths, beetles, weevils, and especially the larval forms, are more or less protected mimetically; and in fact almost the entire population of the tropics is guilty ot personation in ways known or unknown. The lichen-mimicking insects even go the length of imitating holes, by means of mirror-like pools of black irregularly disposed on the back, or interruptings the otherwise dangerous symmetry of the fringed sides. The philosophy of these coal-black marking greatly puzzled me for a time. The first I saw was on a specimen of the singular and rare *Harpax ocellaria*, which had been thrown on the camp fire clinging to a lichen-covered log, and so well carried out

was the illusion that even the natives were deceived till the culprit betrayed its quality by erecting its gauzy wings.

But it would be tedious to recount further the divisive ways of these arch-deceivers, and I shall only refer to another mimetic form, which for cool Pharisaism takes the palm from every creeping or flying thing. I first saw this *menteur a triple étage* on the Tanganyika plateau. I had lain for a whole week without stirring from one spot—a boulder in the dried-up bed of a stream, for this is the only way to find out what really goes on in nature. A canopy of leaves arched overhead, the home of many birds, and the granite boulders of the dry stream-bed, and all along the banks, were marked with their white droppings. One day I was startled to see one of these droppings move. It was a mere white splash upon the stone, and when I approached I saw I must be mistaken; the thing was impossible; and now it was perfectly motionless. But I certainly saw it move, so I bent down and touched it. It was an animal. Of course it was as dead as a stone the moment I touched it, but one soon knows these impostures, and I gave it a minute or two to become alive—hastily sketching it meantime in case it should vanish through the stone, for in that land of wonders one really never knows what will happen next. Here was a bird-dropping suddenly become alive and moving over a rock; and now it was a bird-dropping again; and yet, like Galileo, I protest that it moved. It would not come to, and I almost feared I might be mistaken after all, so I turned it over on its other side. Now should any sceptic persist that this was a bird-dropping I leave him to account for a bird-dropping with six legs, a head, and a segmented body. Righting the creature, which showed no sign of life through all this ordeal, I withdrew a few paces and watched developments. It lay motionless on the stone, no legs, no head, no feelers, nothing to be seen but a flat patch of white—just such a patch as you could make on the stone in a second with a piece of chalk. Presently it stirred, and the spot slowly sidled across the boulder until I caught the impostor and imprisoned him for my cabinet. I saw in all about a dozen of these insects after this. They are about half the size of a four-penny piece, slightly more oval than round, and as white as a snowflake. This whiteness is due to a number of little tufts of delicate down growing out from minute protuberances all over the back. It is a fringe of similar tufts round the side that gives the irregular margin so suggestive of a splash; and the under surface of the body has no protection at all. The limbs are mere threads, and the motion of the insect is slow and monotonous, with frequent pauses to impress surrounding nature with its moribund condition. Now unless this insect with this color and habit were protectively colored it simply would not have a chance to exist. It lies fearlessly exposed on the bare stones during the brightest hours of the tropical day, a time when almost every other animal is skulking out of sight. Lying upon all the stones round about are the genuine droppings of birds; and when one sees the two together it is difficult to say whether one is most struck with the originality of the idea, or the extraordinary audacity with which the *rôle* is carried out.*

It will be apparent from these brief notes that mimicry is not merely an occasional or exceptional phenomenon, but an integral part of the economy of nature. It is not a chance relation between a few objects, but a system so widely authorized that

* It is a considerable responsibility to be the sole witness to this comedy—though I saw it repeated a dozen times subsequently—but fortunately for my veracity, I have since learned from Mr. Kirby of the British Museum that there is an English beetle, the *Cionus Blattariæ*, the larval form of which "operates" in a precisely similar way.

probably the whole animal kingdom is more or less involved in it; a system, moreover, which, in the hands of natural selection, must ever increase in intricacy and beauty. It may also be taken for granted that a scheme so widespread and so successful is based upon some sound utilitarian principle. That principle, I should say, was probably its *economy*. Nature does everything as simply as possible, and with the least expenditure of material. Now consider the enormous saving of muscle and nerve, of instinct and energy, secured by making an animal's lease of life to depend on passivity rather than activity. Instead of having to run away, the creature has simply to keep still; instead of having to fight, it has but to hide. No armor is needed, no powerful muscle, no expanse of wing. A few daubs of color, a little modelling of thorax and abdomen, a deft turn of antennæ and limb, and the thing is done.

At the first revelation of all these smart hypocrisies one is inclined to brand the whole system as cowardly and false. And, however much the creatures impress you by their cleverness, you never quite get over the feeling that there is something underhand about it; something questionable and morally unsound. The evolutionist, also, is apt to charge mimetic species in general with neglecting the harmonious development of their physical framework, and by a cheap and ignoble subterfuge evading the appointed struggle for life. But is it so? Are the æsthetic elements in nature so far below the mechanical? Are color and form, quietness and rest, so much less important than the specialization of single function or excellence in the arts of war? Is it nothing that, while in some animals the disguises tend to become more and more perfect, the faculties for penetrating them, in other animals, must continually increase in subtlety and power? And, after all, if the least must be said, is it not better to be a live dog than a dead lion?

VIII.

A GEOLOGICAL SKETCH.

From the work of the various explorers who have penetrated Africa, it is now certain that the interior of that Continent is occupied by a vast plateau from 4000 to 5000 feet above the level of the sea. In five separate regions—in the North-east, in Abyssinia, in the Masai country, on the Tanganyika plateau, and in the district inland from Benguela—this plateau attains a height of considerably over 5000 feet; while towards the coasts, throughout their entire length, both east and west, it falls with great uniformity to a lower plateau, with an elevation of from 1000 to 2000 feet. This lower plateau is succeeded, also with much uniformity along both coast lines, by littoral and deltoid plains, with an average breadth from the sea of about 150 miles.

The section which I am about to describe, entering Africa at the Zambesi and penetrating inwards to the Tanganyika plateau, traverses each of these regions in turn—the coast-belt, the lower fringing table-land, the great general plateau of the country, and the third or highest elevation of the Tanganyika table-land. To deal thoroughly with so vast a region in the course of a single exploration is out of the question; and I only indicate here a few of the rough results of what was no more than a brief and hasty reconnaissance.

The first and only geological feature to break the monotony of mangrove-swamp and low grass plain of the coast-belt is the débris of an ancient coral-reef, studded with sponges and other organisms. This reef is exposed on the Qua-qua River, a little above Mogurrumba,

and about fifty miles from the sea. It is of small extent, at no great height above the present sea-level, and, taken alone, can only argue for a very inconsiderable elevation of the coast region. Some twenty miles farther inland, and still only a few yards above sea-level, an inconspicuous elevation appears, consisting of sedimentary rocks. This belt is traceable for some distance, both north and south, and a poor section may be found in the Zambesi River, a few miles above the grave of Mrs. Livingstone at Shupanga. The rocks in question, which are only visible when the Zambesi is very low, consist of a few thin beds of red and yellow sandstones, with intercalated marly sandstones and fine conglomerates. Sedimentary rocks, in a somewhat similar relation, are found at least as far north as Mombassa, above Zanzibar, and as far south as the Cape; and it seems probable that the whole of the plateau of the interior is fringed by this narrow belt. No organic remains have been found in this series north of Natal, but the fossils of the Cape beds may shed some light on its horizon. Associated probably with these rocks are the great beds of coal which are known to exist some distance up the river in the neighborhood of Tette.

A short distance above the junction of the River Shiré with the Zambesi the first hills of the plateau begin almost abruptly. They occur in irregular isolated masses, mostly of the saddle-back order, and varying in height from 100 or 200 to 2000 feet. Those I examined consisted entirely of a very white quartzite—the only quartzite, I may say, I ever saw in East Central Africa. At the foot of the most prominent of those hills—that of Morumballa—a hot-spring bubbles up, which Livingstone has already described in his "Zambesi." Hot-springs are not uncommon in other parts of the Continent, and several are to be found on the shores of Lake Nyassa. These are all of the simplest type, and although the temperature is high they leave no deposit anywhere to indicate their chemical character.

Two or three days' journey, north and west of Morumballa, among the distant hills which border the valley of the Shiré, Livingstone marks a spot in his sketch-map where coal is to be found. After examining the neighborhood with some care, and cross-examining the native tribes, I conclude that Livingstone must, in this instance, have been either mistaken or misinformed. A black rock certainly occurs at the locality named, but after securing specimens of this as well as of all the dark-colored rocks in the vicinity, I found them to be, without exception, members of the igneous class. One very dark diorite was probably the rock which, on a distant view, had been mistaken for coal, for none of the natives along the whole length of the lower Shiré had ever heard of "a black rock which burned." Coal however, as already mentioned, does certainly occur farther inland on the Zambesi; while, farther south, the Natal and Transvaal coalfields are now well known.

While speaking of coal I may best refer here to a small coal-bed associated with an apparently different series of rocks, and of special interest from its occurrence in the far interior of the country. On the western shore of Lake Nyassa, about 10° south latitude, coal was reported a few years ago by a solitary explorer, who penetrated that region prospecting for gold in the wake of Livingstone. The importance of such a discovery—a coal-seam on the borders of one of the great inland seas of Africa—cannot be over-estimated; and the late Mr. James Stewart, C. E., who has done such important work for the geography of Africa, made a special examination of the spot. From his report to the Royal Geographical Society, I extract the following reference:—

"On the 29th we marched northwards along the coast, reaching, after three miles, the stream in which is the coal discovered by Mr. Rhodes. The coal lies in a clay bank, tilted up at an angle of 45°, dip west. It is laid bare over only some 30 feet, and is about 7 feet thick. It hardly looks as if it were in its original bed. The coal is broken and thrown about as if it had been brought down by a landslip, and traces of clay are found in the interstices. Yet the bed is compact, and full of good coal. I traced it along the hillside for some 200 yards, and found it cropping out on the surface here and there. It is 500 feet above the lake-level, and about a mile and a half from the shore. I lit a good fire with it, which burned up strongly. The coal softened and threw out gas bubbles, but gave no gas-jets. It caked slightly, but not so as to impede its burning."—*Proceedings*, vol. iii. No. 5, p. 264.

I examined this section pretty carefully, and fear I must differ slightly from Mr. Stewart in his geological and economical view of the formation. The 7-foot seam described by Stewart is certainly a deception, the seam being really composed of a series of thin beds of alternately carbonaceous and argillaceous matter, few of the layers of coal being more than an inch in thickness. With some of the most carefully selected specimens I lit a fire, but with disappointing results. Combustion was slow, and without flame. Although there were what can only be called *films* of really good coal here and there, the mineral, on the whole, seemed of inferior quality, and useless as a steam-coal. From the general indications to the locality I should judge that the coal existed only in limited quantity, while the position of the bed at the rop of a rocky gorge renders the deposit all but inaccessible. On the whole, therefore, the Lake Nyassa coal, so far as opened up at present, can scarcely be regarded as having any great economical importance, although the geological interest of such a mineral in this region is considerable. Sections of the coal have already been prepared for the microscope, and Dr. Carruthers of the British Museum has identified the macrospores of Lycopodacious plants, which are identical with similar organisms found in the coal-fields of England.

The Geology of the great African plateaux, so far as my section from the Lower Shiré to the Tanganyika plateau is any indication of their general structure, is of such simplicity that it may almost be dismissed in a sentence. The whole country from the Shiré river, a hundred miles above its junction with the Zambesi, embracing the lower and higher central plateaux, the whole Shiré Highlands from the river to the westward shores of Lake Shirwa, the three hundred miles of rocky coast fringing the western shore of Lake Nyassa, the plateau between Nyassa and Tanganyika for at least half its length—with one unimportant interruption—consists solely of granite and gneiss. The character and texture of this rock persist with remarkable uniformity throughout this immense region. The granite, an ordinary gray granite, composed of white rarely pink orthoclase felspar, the mica of the biotitic or magnesian variety, rarely muscovite, and neither fine nor coarse in texture; the gneiss, the same rock foliated. Of the relation of these gneissose and granitic rocks to one another I was unable to discover any law. Sometimes the gneiss would persist over a large area, sometimes the granite; while frequently the two would alternate perplexingly within a limited area. Mr. Joseph Thompson's section, drawn inland from Zanzibar and joining mine at the northern end of Lake Nyassa, and thence onwards by a more easterly route towards Tanganyika, reveals a somewhat similar petrographical struc-

ture; and, from scattered references in the journals of other explorers, it is plain that this gneisso-granitic formation occupies a very large area in the interior of the African Continent. Associated minerals with these rocks, as far as a very general survey indicated, were all but wholly wanting. At Zomba, on the Shiré Highlands, a little tourmaline occurs, but of the precious metals I could find no trace. Veins of any kind are also rare; and even pegmatite I encountered in only one instance. Intrusive dykes throughout the whole area were likewise absent except in a single district. This district lies towards the southern border of the Shiré Highlands, immediately where the plateau rises from the river, and there the dykes occur pretty numerously. They are seldom more than a few feet in breadth, and consist of ordinary dolerite or basalt. The black rock on the Lower Shiré, already mentioned in connection with Livingstone's supposed discovery of coal, may possibly be one of these dykes; but that there is any considerable development of igneous rocks in this immediate locality I should doubt. Farther up the Zambesi, however, coulées of basalt are met with at more than one place, conspicuously in the neighborhood of the Victoria Falls. The only distinct trace of volcanic action throughout my route appeared towards the extreme northern end of the Lake Nyassa. One is warned beforehand by occasional specimens of pumice lying about the lake shore as one travels north; but it is not till the extreme end of the lake is reached that the source is discovered in the series of low volcanic cones which Thompson has already described in this locality. The development is apparently local, and the origin of the cones probably comparatively recent.

Apart from this local development of igneous rocks at the north end of Lake Nyassa, the only other break in the granitic series throughout the area traversed by my line of march occurs near the native village of Karonga, on Lake Nyassa. About a dozen miles from the north-western lake shore on the route to Tanganyika, after following the Rukuru river through a defile of granite rocks, I came, to my great surprise, upon a well-marked series of stratified beds. At a bend in the river a fine section is exposed. They lie thrown against the granitic rocks, which here show signs of disturbance, and consists of thin beds of very fine light-gray sandstone, and blue and gray shales, with an occasional band of gray limestone. By camping at the spot for some days, and working patiently, I was rewarded with the discovery of fossils. This is, of course, the main interest of these beds,—for these are, I believe, the only fossils that have ever been found in Central Africa. The shale, naturally, yielded the most productive results, one layer especially being one mass of small *Lamellibranchiata*. Though so numerous, these fossils are confined to a single species of the *Tellinidæ*, a family abundantly represented in tropical seas at the present time, and dating back as far as the Oölite. Vegetable remains are feebly represented by a few reeds and grasses. Fish-scales abound; but I was only able, and that after much labor, to unearth two or three imperfect specimens of the fishes themselves. These have been put into the accomplished hands of Dr. Traquair of Edinburgh, who has been kind enough to furnish the following account of them:—

EDINBURGH, *23d April*, 1888.

DEAR PROFESSOR DRUMMOND. — I have carefully examined the six specimens of fossil fish-remains from Central Africa, which you submitted to me, and though I certainly would have wished them to have been less fragmentary, I shall do my best to give an opinion upon them.

No. 1, the largest, is the hinder

portion of a fish of moderate size, showing not only scales, but also the remains of the dorsal, anal, and caudal fins. The caudal is strongly heterocercal, and was probably deeply bifurcated, but the rays of the lower lobe are very badly preserved: only the posterior parts of the dorsal and anal are seen, nearly opposite each other, and composed of fine, closely placed, and closely articulated rays. The scales, displaced and jumbled up, are osseous thick, and rhomboidal, with a strong blunt carina on the attached surface, while the exposed part of the external surface is covered with ganoine, and ornamented with rather sparsely scattered pits and punctures.

Belonging to the Order Ganoidei, this fish is with equal certainty referable to the family Palæoniscidæ, but its *genus* is more a matter of doubt owing to the fragmentary nature of the specimen. Judging from the form and thickness of the scales, I should be inclined to refer it to *Acrolepis*, were it not that the dorsal and anal fins seem so close to the tail, and so nearly opposite each other; here, however, it may be remarked that the disturbed state of the scales affords room for the possibility that the original relations of the parts may not be perfectly preserved. I have, however, no doubt that, as a *species*, it is new; and as you have been the first to bring fossil fishes from those regions of Central Africa, you will perhaps allow me to name it *Acrolepis* (?) *Drummondi*.

No. 2 is a piece of cream-colored limestone, with numerous minute, scattered, rhombic, striated, ganoid scales, which I cannot venture to name, though I believe them to be palæoniscid. Associated with these is a small portion of the margin of a jaw, with numerous minute sharp conical teeth. But also lying among these minuter relics is a scale of a much larger size, and clearly belonging to another fish. It measures 1-4 inch in height by the same in breadth; its shape is rhomboidal, having an extensive anterior covered area, and a strong articular spine projecting from the upper margin. The free surface is brilliantly ganoid, and marked with furrows separating feeble ridges, which pass rather obliquely downwards and backwards across the scale, and terminate in eight sharp denticulations of the hinder margin. A little way off is the impression of the attached surface of a similar scale, and there are also two interspinous bones, probably belonging to the same fish.

This is probably also a palæoniscid scale, resembling in shape those of *Acrolepis*, but it is rather thinner than is usually the case in this genus. It has also considerable resemblance to some of those scales from the European Trias, named by Agassiz *Gyrolepis*. Though it may be rather venturesome to name a species from such slender material, nevertheless we may provisionally at least, recognize the scale as *Acrolepis* (?) *Africanus*.

Nos. 3 and 4 are small pieces of the same limestone, covered with the minute striated palæoniscid scales referred to above.

No. 5 is a piece of gray micaceous shale, with scales of yet a fourth species of palæoniscid fish. One conspicuous scale unfortunately, like all the rest, seen only from the attached surface, is 1-6 inch in height by nearly 1-4 in breadth; it is tolerably rectangular in shape, having a well-developed articular spine and fossette. Part of the scale is broken away at the anterior margin, the impression brought into view showing that the covered area is narrow, and indicating that the free surface is striated with rather sharp ridges passing obliquely across the scale. The posterior margin is finely denticulated.

Though this scale is in my opinion specifically, and possibly generically, distinct from those previously named, the outer surface not being properly displayed renders it impos-

sible to give a sufficient diagnosis.

No. 6 is a piece of the same shale, having the clavicle of a small palæoniscid fish, which it is, however, impossible to name.—I am, yours faithfully, R. H. TRAQUAIR.

These fossiliferous beds seem to occupy a comparatively limited area, and have a very high dip in a south-easterly direction. At the spot where my observations were taken they did not extend over more than half a mile of country, but it is possible that the formation may persist for a long distance in other directions. Indeed, I traced it for some miles in the direction in which, some fifty or sixty miles off, lay the coal already described, and to which it may possibly be related.

With one or two general remarks upon surface geology and physical geography I bring this note to a close. First, regarding the Lakes Nyassa and Shirwa,—there is distinct evidence, and especially in the case of the latter, that they have formerly occupied a considerably larger area than at present. Shirwa is an extremely shallow lake; though the eastern and southern shores are mountainous it is suggestive rather of an immense bog than of a deep inland sea. For many miles before reaching the shore there are signs that one is traversing the site of a former and larger Shirwa, which may possibly at one time have been actually connected with the lower extremity of Lake Nyassa. To substantiate this conclusion, however, will require more detailed examination of the Shiré Highlands than I was able to give. The peculiarity of Shirwa is that the water is brackish to the taste, while that of Nyassa and of the other Central African lakes, with the exception of Lake Leopold, is fresh. The shallowness of Shirwa, and the precariousness of its outlet through Lake Cheuta to the Lujenda, amply account for this difference; for the narrow waters of Nyassa and Tanganyika are thoroughly drained and profoundly deep.

That Lake Nyassa is also slowly drying up is evident from the most superficial examination of its southern end. There it has already left behind a smaller lake—Lake Pomalombé—a considerable expanse of water, through which the Shiré passes a few miles after emerging from Lake Nyassa, but already so shallow that nowhere in the dry season does the depth exceed three fathoms. If the silting up of this lake continues for a few years it will render this sheet of water, which commands the entrance to Lake Nyassa, totally unnavigable, and thus close the magnificent water-highway at present open with a portage of of seventy miles, from the top of Lake Nyassa to the Indian Ocean at the mouth of the Zambesi.

Regarding the interesting question of the origin of Lake Nyassa and its great sister-lakes in the heart of Africa—the Victoria and Albert Nyanza and Tanganyika— I do not presume to speak. No follower of Ramsay in his theory of the glacial origin of lakes could desire a more perfect example of a rock-basin than that of Lake Nyassa. It is a gigantic trough of granite and gneiss, three hundred miles in length, nowhere over fifty miles in breadth, and sixteen hundred feet above the level of the sea, the mountains rising all around it, and sometimes almost sheer above it, to a farther height of one, two, and three thousand feet. The high Tanganyika plateau borders it on the northern shore, and the greatest depth is precisely where the glacial theory would demand, namely, towards the upper portion of the lake. On the other hand, the physical geology of the country in which these other lakes are situated, as well as several features connected with Lake Nyassa itself, lend no countenance to such a view; and probably the suggestion of Murchison and other geologists is correct, that all these

lakes, colossal though they still are, are the remnants of a much vaster expanse of water which once stretched over Central Africa.

The only other point to which I need allude is the subject of glaciation itself. And I refer to this pointedly, because I have lately encountered allusions, and in quarters entitling them to respect, to the presence of glacial phenomena in the Central Lake district of Africa. I confess that my observations have failed to confirm these suggestions. It has been my lot to have had perhaps exceptional opportunities of studying the phenomena of glaciation in Europe and Northern America, and I have been unable to detect anywhere in the interior of Africa a solitary indication of glacial action. In Kaffirland, far to the south, there are features which one would almost unhesitatingly refer to glaciation; but in East Central Africa not a vestige of boulder-clay, nor moraine matter, nor striæ, nor glaciated surface, nor outline, is anywhere traceable. One would be curious to know to what extent the flora and fauna of the inland plateau confirm or contradict this negative evidence against the glaciation of this region.

Finally, the thing about the geology of Africa that strikes one as especially significant is, that throughout this vast area, just opening up to science, there is nothing new—no unknown force at work; no rock strange to the petrographer; no pause in denudation; no formation, texture, or structure to put the law of continuity to confusion. Rapid radiation, certainly, replaces the effects of frost in northern lands—and the enormous denudation due to this cause is a most striking feature of tropical geology. The labors of the worm, again, in transporting soil in temperate climates are undertaken by the termite; but here, as elsewhere, every fresh investigation tends to establish more and more the oneness and simplicity of Nature.

IX.

A POLITICAL WARNING.

When I reached the coast to embark for England after my wanderings in the interior, the Portuguese authorities at Quilimane presented me with various official documents, which I was told I must acknowledge with signatures and money before being permitted to leave Africa. Having already had to pay certain moneys to Portugal to get into this country, it was a shock to find that I had also to pay to get out; but as no tax could be considered excessive that would facilitate one's leaving even the least of the Portuguese East African colonies, I cheerfully counted out the price of my release. Before completing the conveyance, however, my eye fell on six words prominently endorsed on one of the documents, which instantly tightened my purse-strings. The words were, "Tax for residing in the Interior"—so much. Now a day or two spent in waiting for a steamer could scarcely be construed into residence, nor could a strip of coast-line with propriety be termed the interior, so I ventured to point out the irrelevancy to the Portuguese official. Waiving the merely philological question of residence, he went at once to the root of the matter by informing me that the Portuguese definition of the word Interior differed materially from that of England. The Interior, he said, comprised the whole of Africa inland from the coast province of Mozambique, and included, among other and larger possessions, the trifling territories of the Upper Shiré, the Shiré Highlands, Lake Shirwa, and, Lake Nyassa. These last, he assured me, belonged to Portugal, and it became me, having therein shared the protection of that ancient flag, to acknowledge the obligation to the extent of so many hundred Reis.

Though not unprepared for this

assumption, the idea of enforcing it by demanding tribute was so great a novelty that, before discharging my supposed liabilities, I humbly asked information on the following points ;—1. Did the region described really belong to Portugal? 2. When and where was this claim recognized by England directly or indirectly? 3. Where in the Interior, as thus defined, was the Portuguese flag to be found? And 4. What protection had it ever given to me or to any other European? The replies to these queries being evasive, I took it upon myself to correct the history, the geography, and the politics of the throng of Government officials who now joined the sederunt by the following statement of facts :—1. The region described did not belong to Portugal. 2. Its sovereignty had never been in any way acknowledged by England. 3. The Portuguese flag was nowhere to be found there, and never had been there. 4. Not one solitary Portuguese up to that time had ever even set foot in the country—except one man who was brought in for a few weeks under English auspices ; so that no protection had ever been given, or could possibly be given, to me or to any one else. These statements were received in silence, and after much running to and fro among the officials the representative of John Bull, instead of being dragged to prison, and his rifle—his only real escort through Nyassa-land—poinded to pay for his imaginary protection, found himself bowed off the premises with a discharge in full of his debt to Portugal, and the unpaid tax-paper still in his pocket.

I recall this incident to introduce in all seriousness the question interesting so many at the present moment as to the title-deeds of Equatorial Africa. Why Africa should not belong to the Africans I have never quite been able to see, but since this Continent is being rapidly partitioned out among the various European States, it is well, even in the African interest, to inquire into the nature and validity of these claims. The two political maps which will be found at the end of this volume will enable those interested to see the present situation at a glance, and I shall only further emphasize one or two points of immediate practical importance.

The connection of Portugal with Africa is an old, and—at least it was at first—an honorable one. The voyages of the Portuguese were the first to enrich geography with a knowledge of the African coasts, and so early as 1497 they took possession of the eastern shore by founding the colony of Mozambique. This rule, however, though nominally extending from Delagoa Bay to as far north as Cape Delgado, was confined to two or three isolated points, and nowhere, except on the Zambesi, affected more than the mere fringe of land bordering the Indian Ocean. On the Zambesi the Portuguese established stations at Senna, Tette, and Zumbo, which were used, though on the most limited scale, as missionary and trading centres ; but these are at present all but abandoned and in the last stages of decrepitude. The right of Portugal to the lower regions of the Zambesi, notwithstanding its entire failure to colonize in and govern the country, can never be disputed by any European Power, though the Landeens, or Zulus, who occupy the southern bank, not only refuse to acknowledge the claim but exact an annual tribute from the Portuguese for their occupation of the district.

No one has ever attempted to define how far inland the Portuguese claim, founded on coast-possession, is to be considered good ; but that it cannot include the regions north of the Zambesi—the Shiré Highlands and Lake Nyassa—is self-evident. These regions were discovered and explored by Livingstone. They have been occupied since his time exclusively by British subjects, and

colonized exclusively with British capital. The claim of England, therefore—though nothing but a moral claim has ever been made—is founded on the double right of discovery and occupation; and if it were a question of treaty with the natives, it might possibly be found on private inquiry that a precaution so obvious had not been forgotten by those most nearly interested. On the other hand, no treaties exist with Portugal; there is not a single Portuguese in the country, and until the other day no Portuguese had even seen it. The Portuguese boundary-line has always stopped at the confluence with the Shiré of the river Ruo, and the political barrier erected there by Chipitula and the river Chiefs has been maintained so rigidly that no subject of Portugal was ever allowed to pass it from the south. Instead, therefore, of posessing the Shiré Highlands, that is the region of all others from which the Portuguese have been most carefully excluded.

The reason for this enforced exclusion is not far to seek. At first the Portuguese had too much to do in keeping their always precarious foothold on the banks of the Zambesi to think of the country that lay beyond; and when their eyes were at last turned towards it by the successes of the English, the detestation in which they were by this time held by the natives—the inevitable result of long years of tyranny and mismanagement—made it impossible for them to extend an influence which was known to be disastrous to every native right. Had the Portuguese done well by the piece of Africa of which they already assumed the stewardship, no one now would dispute their claim to as much of the country as they could wisely use. But when even the natives have had to rise and by force of arms prevent their expansion, it is impossible that they should be allowed to overflow into the Highland country—much less to claim it—now that England, by pacific colonization and missionary work, holds the key to the hearts and hands of its peoples. By every moral consideration the Portuguese have themselves forfeited the permission to trespass farther in Equatorial Africa. They have done nothing for the people since the day they set foot in it. They have never discouraged, but rather connived at, the slave-trade; Livingstone himself took the servant of the Governor of Tette red-handed at the head of a large slave-gang. They have been at perpetual feud with the native tribes. They have taught them to drink. Their missions have failed. Their colonization is not even a name. With such a record in the past, no pressure surely can be required to make the Government of England stand firm in its repudiation of a claim which, were it acknowledged, would destroy the last hope for East Central Africa.

England's stake in this country is immeasurably greater than any statistics can represent, but a rough estimate of the tangible English interest will show the necessity of the British Government doing its utmost at least to conserve what is already there.

The Established Church of Scotland has three ordained missionaries in the Shiré Highlands, one medical man, a male and a female teacher, a carpenter, a gardener, and other European and many native agents. The Free Church of Scotland on Lake Nyassa has four ordained missionaries—three of whom are doctors—several teachers and artizans, and many native catechists. The Universities Mission possesses a steamer on Lake Nyassa, and several missionary agents; while the African Lakes Company, as already mentioned, has steamers both on the Shiré and Lake Nyassa, with twelve trading stations established at intervals throughout the country, and manned by twenty-five European agents. All these

various agencies, and that of the brothers Buchanan at Zomba, are well equipped with buildings, implements, roads, plantations, and gardens; and the whole represents a capital expenditure of not less than £180,000. The well-known editor of Livingstone's Journals, the Rev. Horace Waller, thus sums up his account of these English enterprises in his *Title-Deeds to Nyassa-Land*: "Dotted here and there, from the mangrove swamps at the Kongoné mouth of the Zambesi to the farthest extremity of Lake Nyassa, we pass the graves of naval officers, of brave ladies, of a missionary bishop, of clergymen. Foreign Office representatives, doctors, scientific men, engineers, and mechanics. All these were our countrymen: they lie in glorious graves; their careers have been foundation-stones, and already the edifice rises. British mission stations are working at high pressure on the Shiré Highlands, and under various auspices, not only upon the shores of Lake Nyassa, but on its islands also, and by desperate choice as it were, in the towns of the devastating hordes who live on the plateaux on either side of the lake. Numbers of native Christians owe their knowledge of the common faith to these efforts; scores of future chiefs are being instructed in the schools, spread over hundreds of miles; plantations are being mapped out; commerce is developing by sure and steady steps; a vigorous company is showing to tribes and nations that there are more valuable commodities in their land than their sons and daughters." This is the vision which Livingstone saw, when, in the last years of his life, he pleaded with his fellow-countrymen to follow him into Africa. "I have opened the door," he said, "I leave it to you to see that no one closes it after me."

The urgency of the question of Portuguese as against British supremacy in Equatorial Africa must not blind us, however, to another and scarcely less important point—the general European, and especially the recent German, invasion of Africa. The Germans are good, though impecunious colonists, but it cannot be said that they or any of the other European nations are as alive to the moral responsibilities of administration among native tribes as England would desire. And though they are all freely entitled to whatever lands in Africa they may legitimately secure, it is advisable for all concerned that these acquisitions should be clearly defined and established in international law, in order that the various Powers, the various trading-companies, and the various missions, may know exactly where they stand. The almost hopeless entanglement of the Foreign Powers in Africa at present may be seen from the following political "section," which represents the order of occupation along the Atlantic seaboard from opposite Gibraltar to the Cape:—

POLITICAL "SECTION" OF WESTERN AFRICA.

Spain	.	Morocco.
France	.	"
Spain	.	Opposite the Canaries.
France	.	French Senegambia.
Britain	.	British "
France	.	French "
Britain	.	British "
Portugal	.	Portuguese "
France	.	
Britain	.	Sierra Leone.
Liberia	.	Republic of Liberia.
France	.	Gold Coast.
England	.	Gold Coast.
France	.	Dahomey.
Unapprop'd,		"
England	.	Niger.
Germany	.	Cameroons.
French	.	French Congo.
Portuguese,		Portuguese Congo.
International		Congo.
Portuguese,		Angola.
Portuguese,		Benguela.
Germany	.	Angra Pequena.

England .	Walvisch Bay.
Germany .	Orange River.
England .	Cape of Good Hope.

These several possessions on the western coast have at least the advantage of being to some extent defined, but those on the east, and especially as regards their inland limits, are in a complete state of chaos. It seems hopeless to propose it, but what is really required is an International Conference to overhaul title-deeds, adjust boundary-lines, delimit territories, mark off states, protectorates, lands held by companies, and spheres of influence. England's interest in this must largely be a moral one. Her ambitions in the matter of new territories are long ago satisfied. But there will be certain conflict some day if the portioning of Africa is not more closely watched than it is at present.

As an example of the complacent way in which vast tracts in Africa are being appropriated, glance for a moment at the recent inroads of the Germans. On the faith of private treaties, and of an agreement with Portugal, Germany has recently staked off a region in East Central Africa stretching from the boundaries of the Congo Free State to the Indian Ocean, and embracing an area considerably larger than the German Empire. To a portion only of this region—the boundaries of which, contrasted with that arbitrarily claimed in addition, will be apparent from a comparison of the maps—have the Germans procured a title; and the steps by which this has been attained afford an admirable illustration of modern methods of land-transfer in Africa. What happened was this :—

Four or five years ago Dr. Karl Peters concluded treaties with the native chiefs of Useguha, Ukami, Nguru and Usagara, by which he acquired these territories for the Society for German Colonization. The late Sultan of Zanzibar attempted to remonstrate, but meantime an imperial "Schutzbrief" had been secured from Berlin, and a German fleet arrived at Zanzibar prepared to enforce it. Britain appealed to Germany on the subject, and a Delimitation Commission was appointed, which met in London. An agreement was come to, signed by Lord Iddesleigh on 29th October, 1886, and duly given effect to. The terms of this Anglo-German Convention have been recently made public in a well-informed article by Mr. A. Silva White (*Scottish Geographical Magazine*, March, 1888), to which I am indebted for some of the above facts, and the abstract may be given here intact, as political knowledge of Africa is not only deficient, but materials for improving it are all but inaccessible. In view, moreover, of the spirit of acquisitiveness which is abroad among the nations of Europe, and of recent attempts on the part of Germany to claim more than her title allows, the exact terms of this contract ought to be widely known :—

I. Both Powers recognize the sovereignty of the Sultan of Zanzibar over the islands of Zanzibar and Pemba, Lamu and Mafia, as also over those small islands lying within a circuit of twelve nautical miles of Zanzibar. Both Powers also recognize as the Sultan's possessions on the mainland an uninterrupted coast-line from the mouth of the Miningani River at the entrance of the bay of Tunghi (south of Cape Delgado) as far as Kipini (south of Wito). This line encloses a coast of ten nautical miles inland for the whole distance. The northern boundary includes Kau; north of Kipini, both Powers recognize as belonging to the Sultan of Zanzibar the stations of Kisimayu, Brava, Merka, and Makdishu (Magadoxo), each with a land circuit of ten nautical miles, and Warsheikh with a land circuit of five nautical miles.

II. Great Britain engages herself to support those negotiations of Germany with the Sultan which

have for their object the farming out (*Verpachtung*) of the customs in the harbors of Dar-es-Salaam and Pangani to the German East African Association, on the payment by the Association to the Sultan of an annual guaranteed sum of money.

III. Both Powers agree to undertake a delimitation of their respective spheres of influence in this portion of the East African Continent. This territory shall be considered as bounded on the south by the Rovuma River, and on the north by a line, commencing from the mouth of the Tana River, following the course of this river or its tributaries, to the intersection of the Equator with the 38th degree of east longitude, and from thence continued in a straight line to the intersection of the 1st degree of north latitude with the 37th degree of east longitude. The line of demarkation shall start from the mouth of the river Wanga, or Umbe, and follow a straight course to Lake Jipé (south-east of Kilima-njaro), along the eastern shore and round the northern shore of the lake, across the river Lumi, passing between the territories of Taveta and Chagga, and then along the northern slope of the Kilima-njaro range, and continued in a straight line to the point on the eastern shore of Lake Victoria Nyanza which is intersected by the 1st degree of south latitude.

Great Britain engages herself to make no territorial acquisitions, to accept no Protectorates, and not to compete with the spread of German influence to the south of this line, whilst Germany engages herself to observe a similar abstinence in the territories to the north of this line.

IV. Great Britain will use her influence to promote the conclusion of a friendly agreement concerning the existing claims of the Sultan of Zanzibar and the German East African Association, on the Kilima-njaro territory.

V. Both powers recognize as belonging to Wito the coast stretching from the north of Kipini to the north end of Manda Bay.

VI. Great Britain and Germany will conjointly call upon the Sultan of Zanzibar to recognize the General Act of the Berlin Conference, save and except the existing rights of His Highness as laid down in Art. I. of the Act.

VII. Germany binds herself to become a party to the Note signed by Great Britain and France on the 10th March, 1862, in regard to the recognition of the independence of Zanzibar.

This is the only document which can have any validity, and such German claims—outside the limit here assigned—as are represented on the newer German maps, are to be treated as mere chartographical flourishes. Encouraged, however, by this success in securing territory in Africa, and without stopping to use or even to proclaim their protectorate over more than a fraction of the petty states comprised within it, the Germans instantly despatched expedition after expedition to secure further conquests in the remoter and unappropriated districts. Dr. Karl Peters himself led one large expedition; Dr. Jühlke negotiated agreements with the tribes on the distant Somal coast; and other explorers brought back rare and heavy spoil —on paper—to Berlin. So the swallowing up of Africa goes on. The slices cut are daily becoming bigger, and in a few years more not a crumb of the loaf will remain for those who own it now. The poor Sultan of Zanzibar, who used to boast himself lord of the whole interior, woke up, after the London Convention, to find that his African kingdom consisted of a ten-mile-wide strip of coast-line, extending from Kipini to the Miningani River. Even this has already been sold or leased to the English and Germans, and nothing now remains to His Highness but a few small islands.

Since turning her attention to-

wards Africa, Germany has not only looked well after new territory, but seized the opportunity to inspect and readjust the title-deeds to her other African property. We find a new treaty concluded in 1885 between her and the British Protectorate in the Niger regarding the Cameroons; another towards the close of the same year with France on the same subject, and securing rights to Malimba and Great Batonga; and a third with Portugal in 1887, defining, in the interests of the latter, the boundaries of Angola, and ceding to Germany, as a *quid-pro-quo*, an acknowledgment of the claim of the Germans—which, of course, England repudiates—to East Central Africa from the coast to the south end of Tanganyika and Lake Nyassa, as far as the latitude of the Rovuma.

These facts prove the genuine political activity of at least one great European power, and offer a precedent to England, which, in one respect at least, she would do well to copy. Her title-deeds, and those of certain districts in which she is concerned, are not in such perfect order as to justify the apathy which exists at present, and her interests in the country are now too serious to be the prey of unchallenged ambitions, or left at the mercy of any casual turn of the wheel of politics.

Thanks, partly, to the recent seizure by Portugal of the little Zambesi steamer belonging to the African Lakes Company — on the plea that vessels trading on Portuguese waters must be owned by Portuguese subjects, and fly the Portuguese flag—and to influential deputations to head-quarters on the part of the various Missions, the Foreign Office is beginning to be alive to the state of affairs in East Central Africa. The annexation of Matabeleland will be a chief item on the programme with which it is hoped the Government will shortly surprise us; but, what is of greater significance, it will probably include a declaration of the Zambesi as an open river, and the abolition or serious restriction of the present customs tariff. Important as these things are, however, they affect but slightly the two supreme English interests in East Central Africa—the suppression of the slave-trade and the various missionary and industrial enterprises. The most eager among the supporters of these higher interests have never ventured to press upon Government anything so pronounced as that England should declare a Protectorate over the Upper Shiré and Nyassa districts; but they do contend, and with every reason, for the delimitation of part of this region as a "Sphere of British Influence."

Granting even that the shadowy claims of Germany and Portugal to the eastern shore of Lake Nyassa are to be respected, there remain the whole western coast of the Lake, and the regions of the Upper Shiré which are reached directly from the waters of the Zambesi, without trespassing on the soil of any nation. These regions are not even claimed at present by any one, while by every right of discovery and occupation—by every right, in fact, except that of formal acknowledgment—they are already British. It will be an oversight most culpable and inexcusable if this great theatre of British missionary and trading activity should be allowed to be picked up by any passing traveller, or become the property of whatever European power had sufficient effrontery at this late day to wave its flag over it. The thriving settlements, the schools and churches, the roads and trading-stations, of Western Nyassa-land are English. And yet it is neither asked that they should be claimed by England, annexed by England, nor protected by England. Those whose inspirations and whose lives have created this oasis in the desert, plead only that no intruder now should be allowed to undo their labor or idly

reap its fruits. Here is one spot, at least, on the Dark Continent, which is being kept pure and clean. It is now within the power of the English Government to mark it off before the world as henceforth sacred ground. To-morrow, it may be too late.

IX.

A METEOROLOGICAL NOTE.

The Lake Nyassa region of Africa knows only two seasons—the rainy and the dry. The former begins with great regularity on the opening days of December, and closes towards the end of April; while during the dry season, which follows for the next six months, the sun is almost never darkened with a cloud. At Blantyre, on the Shiré Highlands, the rainfall averages fifty inches; at Bandawé, on Lake Nyassa, a register of eighty-six inches is counted a somewhat dryish season.

The barometer in tropical countries is much more conservative of change than in northern latitudes, and the annual variation at Lake Nyassa is only about half an inch—or from 28·20 inches in November to 28·70 inches in June. The diurnal variation, according to Mr. Stewart, is rarely more than twenty-hundredths of an inch.

The average temperature for the year at Blantyre, where the elevation is about three thousand feet above sea-level, is 50° Fahr., but the mercury has been known to stand ten degrees lower, and on one exceptional occasion it fell 2° below freezing point. At Lake Nyassa, half the height of Blantyre, 85° Fahr. is a common figure for mid-day in the hottest month (November) of the year, while the average night-temperature of the coldest month (May) is about 60°. The lowest registered temperature on the Lake has been 54°, and the highest—though this is extremely rare—100° Fahr. When the Livingstonia Mission occupied the promontory of Cape Maclear, at the southern end of Nyassa, in 1880, one of the then staff, Mr. Harkess, had the energy to keep a systematic record of the temperature, and I am indebted to his notebook for the following table. The figures represent observations taken at 6 A. M., 12 noon, and 6 P. M. A dash indicates that the observation was omitted for the hour corresponding. The wet bulb reads on an average 10° degrees lower.

TABLE OF TEMPERATURES AT LAKE NYASSA.

	May.	June.	July.	Aug.	Sept.		May.	June.	July.	Aug.	Sept.
1	70°	62°	64°	67°	68°	4	68½°	64°	—	62°	71°
	80°	75°	73°	74°	79°		79°	71°	73°	—	77°
	75°	76°	74°	73°	75°		78°	70°	—	—	79°
2	—	60°	64°	68°	69°	5	68°	64°	63°	76°	—
	77°	78°	74°	—	79°		79°	74°	—	—	—
	—	73°	—	74°	75°		76°	74°	71°	—	—
3	67°	65°	62°	65°	66°	6	—	64°	64°	70°	65°
	76°	78°	74°	—	75°		75½°	77°	72°	77°	81°
	76°	74°	70°	—	74°		75·8	76°	74°	—	77°

	May.	June.	July.	Aug.	Sept.
7	66°	67°	64°	61°	72°
	79°	78°	71°	79°	80°
	75°	75°	71°	—	77°
8	65°	66°	64°	—	70°
	74°	74°	—	—	80°
	74°	74°	71°	—	81°
9	—	68°	65°	62°	70°
	77°	76°	75°	79°	81°
	—	73°	73°	—	77°
10	67°	68°	66°	61°	—
	75°	75°	—	81°	80°
	74°	73°	71°	—	77°
11	69°	66°	—	62°	70°
	75°	76°	76°	79°	79°
	—	75°	73°	—	79°
12	—	66°	69°	65°	—
	75°	75°	77°	81°	—
	71°	72°	—	76°	—
13	65°	—		70°	72°
	76°	73°		80°	79°
	74°	—		77°	78°
14	67°	63°		68°	71°
	73°	74°		77°	81°
	71°	—		75°	78°
15	68°	64°	—	66°	72°
	76°	74°	—	—	75°
	75°	72°	76°	—	77°
16	71°	64°	68°	67°	—
	77°	74°	79°	75°	79°
	75°	70°	78°	73°	77°
17	68°	64°	65°	—	—
	78°	74°	77°	—	—
	77°	72°	—	76°	76°
18	72°	71°	68°	68°	73°
	80°	74°	75°	75°	78°
	78°	72°	76°	72°	77°
19	65°	64°	69°	—	—
	74°	—	77°	75°	—
	76°	77°	79°	74°	—

	May.	June.	July.	Aug.	Sept.
20	63°	—	67°	68°	75°
	74°	76°	76°	—	82°
	76°	74°	74°	75°	80°
21	67°	65°	64°	64°	71°
	75°	72°	75°	—	85°
	75°	68°	75°	75°	78°
22	70°	63°	67°	—	72°
	75°	66°	75°	78°	81°
	—	65°	76°	75°	79°
23		58°	65°	—	70°
		67°	77°	79°	82°
		70°	74°	77°	78°
24	—	62°	64°	68°	73°
	76°	—	76°	69°	82°
	76°	—	74°	66°	81°
25	67°	61°	66°	63°	74°
	77°	—	74°	75°	—
	75°	—	75°	71°	78°
26	67°	63°	67°	64°	—
	75°	75°	79°	72°	—
	75°	—	76°	73°	—
27	69°	—	65°	65°	73°
	77°	72°	74°	77°	84°
	74°	—	71°	77°	82°
28	70°	—	65°	70°	73°
	78°	72°	76°	79°	81°
	77°	—	74°	78°	79°
29	68°	63°	65°	—	68°
	80°	71°	72°	76°	82°
	77°	72°	75°	—	80°
30	—	64°	63°	67°	74°
	75°	74°	78°	79°	82°
	76°	—	75°	77°	80°
31	67°		65°	66°	
	74°		76°	79°	
	74°		76°	83°	

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THE PSYCHOLOGY OF ATTENTION.

By TH. RIBOT,

Professor in the Collége de France.

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CHAPTER I.

INTRODUCTION.

Much study has been given to the effects of attention, very little to its mechanism. The latter point alone I propose to consider in this work. Even within these limits the question is important, for, as will be seen later, it is the counterpart, the necessary complement of the theory of association. Should this essay contribute never so little to make plain this *lacuna* in contemporary psychology and to induce others to fill it, its end will have been attained.

Without attempting for the moment to define or characterize attention, I shall suppose that every one understands sufficiently what the term denotes. A greater difficulty is to know where attention begins and where it ends, for it comprises all the degrees between the fleeting instant given to a fly that buzzes at one's ear and the state of complete absorption. It will be in conformity with the rules of correct method if we shall study only plain, typical cases, that is, those which present one, at least, of these two characters —intensity and duration. When the two coincide the attention is at the maximum. Duration standing alone attains the same result: as for example, when by the light of several electric sparks one makes out a word or a figure. Intensity standing alone is equally effective: thus, a woman at a mere glance sees a rival's entire costume. Attention in its fainter forms cannot teach us anything; at all events it would not do to begin our study with them Until we have traced the main outlines, it is idle to note nice distinctions or to lose time in considering subtleties.

The purpose of this work is to establish and to justify the following propositions:

There are two clearly distinct forms of attention, one spontaneous, the other voluntary, artificial.

The first, disregarded by most

psychologists, is the true, primitive, fundamental form of attention. The second, which alone is studied by the majority of psychologists, is but an imitation, a result of education, of training, and of habit. Unsteady and vacillating by nature, it derives all its substance from spontaneous attention and in it alone finds its support. It is but an improved instrument and a product of civilization.

Attention, under its two forms, is no indeterminate activity, no "pure act" of the mind acting in ways mysterious and incomprehensible. Its mechanism is essentially a *motor* mechanism, that is, it acts always upon muscles and through muscles, chiefly in the form of an inhibition; and we might take for the motto of this study that phrase of Maudsley's: "He who is incapable of controlling his muscles is incapable of attention."

Attention under both its forms is an exceptional, abnormal state, which cannot endure for any length of time, because it contradicts the fundamental condition of psychic life —change. Attention is a fixed state. If it be prolonged unduly, especially under unfavorable conditions, then, as every one knows, there is produced a progressive clouding of the mind, and finally a sort of intellectual void often accompanied by vertigo. These slight and passing disorders indicate the radical antagonism between attention and normal psychic life. The approximation toward unity of the consciousness which is the very ground of attention, is seen more clearly still in the distinctly pathological cases which we will consider later, in their chronic form—fixed ideas—and in their acute form —ecstasy.

For the present, still keeping to general considerations, we can, by the help of this very definite character—the tendency to unity of consciousness—reach a definition of attention. Take an adult man, in good health and possessing average intelligence: the ordinary mechanism of his mental life consists in an unceasing come-and-go of inward occurrences—a train of ideas and sensations coalescent or repellent according to certain laws. Properly speaking, this is not, as it is often said to be, a chain, a series, but rather an irradiation in several directions and at different levels: an unstable aggregate that is ever forming, breaking up, and forming again as everyone knows: this mechanism has been very thoroughly studied in our time, and the theory of the association of ideas is one of the points best ascertained in contemporary psychology. Not that everything has been done, for, in our opinion, sufficient account has not been taken of the part played by the *affective* states as a hidden cause of a great many associations. Oftentimes one thought will call forth another, not because of any resemblance between them so far forth as they are representations, but because one same affective fact enwraps them and unites them.* Then, too, we have yet to reduce the laws of association to the laws of physiology, and the psychological mechanism to the cerebral mechanism, which underlies it: but we are still far distant from that ideal.

The normal state is plurality of states of consciousness, or, to use the term employed by some authors, "polyideism." Attention is a momentary stopping of this ceaseless thronging, in favor of one state of consciousness: this is "monoideism." But it is essential to define clearly the sense in which we use this term. Is attention a reduction to one single state of consciousness? No; internal observation teaches that it is only a *relative* monoideism; in other words, that it supposes the existence of a mastering idea which attracts whatever relates to itself and nothing else, allowing associations to form only within very narrow bounds, and only so far as they converge to one

*See examples in James Sully, "Illusions" chapter vii (Humboldt Library, Nos. 56 and 57).

same point. It diverts to its own advantage, at least as far as it can, the whole activity of the brain.

Do there exist cases of *absolute* monoideism, in which consciousness is reduced to one single state wherein the mechanism of association is totally arrested? In our opinion, this does occur in certain very rare cases of ecstasy which we will analyze later; but it lasts only for an instant, because consciousness, being placed outside of the conditions that are strictly necessary for its existence, vanishes.

Attention, then—and again be it remarked that we are considering only clearly-defined cases—attention consists in the substitution of a relative unity of consciousness for a plurality of states of consciousness—for change, which is the rule. Nevertheless this does not suffice for a definition of attention. A violent toothache, a nephretic colic, an intense enjoyment produce a momentary unity of consciousness which we do not confound with attention. Attention has an object; it is not a purely subjective modification: it is a cognition, an intellectual state. Here is another character to be noted.

This is not all. To distinguish it from certain states which approximate to it, and which will be considered in the course of this work—fixed ideas, for example—we must take account of the adaptation which always accompanies it, and which, as we shall endeavor to prove, in great part constitutes it. Wherein consists this adaptation? For the moment let us content ourselves with an entirely superficial view.

In cases of spontaneous attention the whole body converges—the eyes, the ears, sometimes the arms—toward its object; all movements are stayed. The personality is held fast, that is to say, all the individual's tendencies, all his disposable energy are directed upon the same point. The physical, external adaptation is the sign of the psychic, internal adaptation. The convergence is the reduction to unity, substituted in the place of the diffusion of movements and attitudes which characterizes the normal state.

In cases of voluntary attention the adaptation is more commonly incomplete, intermittent, precarious. The movements are arrested, but reappear from time to time. The organism converges, but in a lax and nerveless fashion. The intermittences in the bodily adaptation betoken the intermittences in the mental adaptation. The personality is held fast only partially and momentarily.

I beg the reader to excuse whatever in these remarks is obscure or insufficient. Details and proofs will come later. I have simply designed to prepare the way for a definition, which may be stated in these terms: attention is an intellectual monoideism with adaptation whether spontaneous or artificial of the individual. Or if another formula be preferred, attention consists of an intellectual state, exclusive or predominant, with spontaneous or artificial adaptation of the individual.

And now we quit these general consideration to study the mechanism of all the different forms of attention.

CHAPTER II.

SPONTANEOUS ATTENTION.

Spontaneous attention is the only form of attention that exists save where education and artificial agencies have done their work; no other is seen in most animals and in young children. It is a gift of nature very unequally distributed. But whether strong or weak *its cause is affective states.* Their rule is absolute, and has no exception.

Man, as animal, spontaneously bestows his attention only on that which touches himself, which interests him, which produces in him a state whether agreeable, disagreeable, or mixed. Since pleasure and pain are but signs that certain of our tenden-

cies are gratified or countered; since our tendencies constitute that which is inmost of us; and since they express what is deepest in our personality, our character, it follows that spontaneous attention has its roots in the very foundation of our being. The nature of the spontaneous attention in a person reveals his character, or at the least his fundamental tendencies. It tells us whether the man is a frivolous, commonplace, narrow-minded person, or broad and deep. The portress spontaneously gives her whole attention to gossip; the painter, to a fine sunset, in which the rustic sees only the coming on of night; the geologist, to the stones he sees in his walks, which for the uninitiated have no interest at all. Let the reader look within or around: examples are as easy to find as it is needless to dwell upon them.

That a truth so evident, one confronting us everywhere—indeed spontaneous attention without a prior affective state would be an effect without a cause—that this should not long ago have been a *locus communis* in psychology, might well surprise us, had not most psychologists been set in the determination to study only the higher forms of attention, that is, to begin at the end.* Now, it is important that we study the primitive form: without it nothing is understood, nothing explained, all is confusion, and we are without a clue in this study. Hence we shall not hesitate to multiply proofs.

A man or animal incapable *ex hypothesi* of experiencing pleasure or pain, would be incapable of attention. For him there could be only states more intense than other states—a very different thing. Hence we may not hold, in the same sense as Condillac, that if amid a multitude of sensations one predominates by its liveliness, it is "transformed into attention." It is not intensity alone that acts, but, above all, our adaptation, that is, our tendencies, countered or gratified. Intensity is only one element, often the least. And observe how natural spontaneous attention is, how it requires no effort. The lounger sauntering in the street stands open-mouthed while a procession passes, imperturbable while the spectacle lasts. If at any moment there is an appearance of effort, that betokens that the attention changes its nature—that it becomes voluntary, artificial.

In the lives of great men are found many facts which prove that spontaneous attention depends wholly on the affective states. These facts are the best for our purposes as exhibiting the phenomenon in all its force. Great power of attention is always caused and sustained by great passions. Fourier, says Arago, was wayward and incapable of application till his 13th year; then he was initiated in the elements of mathematics, and became another man. Malebranche took up by chance and with repugnance Descartes's treatise "On Man:" the reading of it "caused him palpitations of the heart so violent that every hour he had to lay down the book and to break off the reading of it so that he might breathe at ease," and he became a Cartesian. "But," it will perhaps be said, "these facts simply betoken a vocation manifesting itself." Yes, but what is a vocation but an attention which finds its way and which decides what course it will take through life? Indeed no finer examples of spontaneous attention are to be found, for this endures, not for a few minutes or for an hour, but always.

Let us consider another side of the question. Is the state of attention continuous? Yes, apparently; in reality it is intermittent. "What is called attending to an object is, strictly speaking, following a series

*So few are the psychologists who have clearly perceived the importance of affective states in attention that the only names I can cite are Maudsley, "Physiology of Mind," chapt. V.; Lewes, "Problems of Life and Mind," vol. III. p. 184; Carpenter, "Mental Physiology," chapt. III.; Norwicz "Psychologische Analysen," vol. I.; and a few disciples of Herbart, in particular Volkmar, "Lehrbuch der Psychologie," vol. II., p. 114.

of connected impressions or thoughts with an ever renewed interest. For instance, when one attends a dramatic show. . . . Even when there is question of a small material object —a coin or a flower—there is a continual passing of the mind from one aspect to another, a series of suggestions. Hence it would be more exact to say that the object is a center of attention, the point from which it starts and to which it is continually returning."*

Certain psycho-physical researches of which we shall speak later (Chap. III) show that attention is subject to the law of rhythm. Mr. J. Stanley Hall, who has carefully studied the subject of gradual changes of pressure produced on the finger tips, finds that the perception of continuity seems impossible—that we cannot have a perception of continuous increase or continuous decrease. Attention chooses among many degrees of pressure to compare them. Certain errors in registering astronomic phenomena are also due to these oscillations of attention.†

Maudsley and Lewes compare attention to reflex action: more properly it might be compared to a series of reflex actions. A physical excitation produces a movement. In like manner, a stimulation coming from the object produces an ever-repeated adaptation. Spontaneous attention, when it is deep and tenacious, possesses all the characters of a passion that is never stilled and which is ever striving to attain its object. The dipsomaniac never sees a glass of liquor but he drinks it, and were some maleficent sprite to fill it as often as it was emptied, he would never cease to drink. The erotic passion acts in the same way. Vicq d' Azyr held that monkeys are not educable becaure they cannot be made attentive—a false assumption, by the way. Gall made answer: Show to a monkey a female monkey and you will see that he is capable of attention. The mind of a Newton acts in like manner when a scientific problem occurs to him: it is a constant irritant ever spurring him on, never leaving him in quiet. No fact is clearer, more incontestable, more easily verified than this: spontaneous attention depends on affective states —desires, gratifications, dissatisfaction, jealousy, etc.; its intensity and duration depend on the intensity and duration of these.

Note here an important fact in the mechanism of attention. This real intermittence in apparent continuity alone makes protracted attention possible. If we keep one eye fixed upon one point, after a while vision becomes indistinct, a cloud forms between the object and us, at last we see nothing. If we lay our hand prone upon a table, without bearing upon it (for pressure is a movement), little by little the sensation grows fainter and finally disappears. The reason is that there is no perception without motion, however faint that may be. All sensoreal organs are at once sensitive and motor. When absolute immobility removes one of the two elements—motility—the function of the other is soon done away. In short, motion is the condition of change, and change is one of the conditions of consciousness. These familiar, every-day facts show us the necessity of these intermittences in attention often imperceptible to consciousness because they are so very brief and very minute.

The physical manifestations of attention are many and of great importance. We will examine them minutely, premising that we consider them less as the effects of this state of the mind than as its necessary conditions—often even as its constituent elements. This study, far from being secondary, is for us of prime importance. To obtain anything like a clear notion of the mechanism of attention, our investigation must be made here. Strictly it is simply an

* Sully "Outlines of Psychology," Chap. IV.

† "American Journal of Psychology," 1887; "Philosophische Studien," 1888.

attitude of the mind, a purely formal state: strip it of all the physical accompaniments which determine it, which give it a body, and there is left a pure abstraction, a phantasm. Hence those who have treated of attention only from the standpoint of interior observation, have been dumb as to its mechanism and have contented themselves with lauding its potency.

We must ever keep in mind this fundamental principle: Every intellectual state is accompanied by determinate physical manifestations. Thought is not, as many still hold by tradition, an event that takes place in a supra-sensuous, ethereal, inapprehsible world. To repeat the dictum of Setchekoff: "No thought without expression;" that is, thought is a word or an act in the nascent state—a beginning of muscular activity. The sensorial forms of attention testify so plainly to this principle that it is not to be questioned: and the same is to be said of that inward and hidden form, of which we will speak later, called Reflection.

The physical concomitents of attention may be classed in three groups; vaso-motor phenomena, respiratory phenomena, and motor or expressional phenomena. These all denote a state of convergence of the organism, and of concentration of work.

I. "Suppose 20 persons fix their attention for 5 to 10 minutes on their little finger. What will happen will be about this. Some of them will have *no* consciousness of any sensation: others will have marked sensations—suffering, pain, arterial pulsations; most of them will feel a faint impression of weight and as of ants creeping. This simple experiment brings up the following questions: Are there not always in sundry parts of the body sensations due to the incessant modifications of the tissues—modifications that pass unnoticed unless attention is fixed upon them? Can the act of attention increase the vascular activity of the sensorial ganglia and produce subjective sensations? Finally, can the sympathetic centers be excited, can the vaso-motor nerves be so influenced as to call forth transient vascular modifications in the finger to which the sensation is referred? The first supposition seems to be only very faintly probable. In fact one may always feel a sensation in the finger when one attentively seeks that sensation. We think the other two suppositions are well grounded. Perhaps the sensation felt is partially subjective; but in our opinion the finger upon which thought is fixed for a sufficient time is really the seat of a sensation. The vascular modifications that ensue are felt in the form of arterial pulsations weight, etc."*

It is highly probable and almost universally admitted that attention, even when it does not apply to any region of our body, is accompanied by local hyperæmia of certain parts of the brain. The vascularization of the parts concerned increases by reason of a greater functional activity. This local hyperæmia has for its cause a dilatation of the arteries, and the cause of this dilatation itself is the action of the vaso-motor nerves upon the muscular coats of the arteries. The vaso-motor nerves depend upon the great sympathetic, which is exempt from the action of the will, but which is subject to all the influences of the affective states. Mosso's experiments show that the most fleeting emotion causes an afflux of blood to the brain. "The circulation of the blood is more active in the cerebral organ while it works than during rest. Hence we are justified in saying that attention in directing itself upon a group of ideas produces an accelerated circulation in the nervous *substratum* of those ideas. Precisely this takes place when an idea takes strong hold of the mind: it keeps up an active circulation in the brain and allows

*Hack Tuke, "Mind and Body." Chapt. 1.

it neither rest nor sleep."* Note, too, the flushing (sometimes the paleness) of the face after prolonged attention.

II. The respiratory modifications which accompany attention resemble the motor phenomona proper and have a part in producing the sense of effort. The rhythm of the respiration changes; it is slowed, and sometimes undergoes a temporary stoppage.

The yawning which follows a prolonged effort of attention is probably the effect of the slowing of the respiration, often, in such cases, we draw a long breath so as fully to renew the air in the lungs. The sigh, another respiratory symptom, is, as sundry authors have remarked, common to attention, and to pain whether physical or moral: its end is to oxygenize the blood that is narcotized by the voluntary or involuntary arrest of respiration.

These facts are so many proofs of what has already been said, namely, that attention is an exceptional, abnormal fact which cannot last long.

III. The bodily movements which, as the phrase goes, express attention, are of the highest importance. In this chapter we can make only a partial study of them; the remainder will find its place under the head of Voluntary Attention (Chapt. III *infra.*); here for the first time we propose to have a glimpse of the motor mechanism of attention.

First we will consider the facts. These have never till our day been seriously studied. Formerly artists, and a few physiognomists too devoted to their fancies, alone took any interest in the matter.

Duchenne, of Boulogne, in this as in many other fields a pioneer, bethought him to substitute the experimental method in place of pure observation as practiced by his predecessors, Charles Bell, Gratiolet, and others. He produced by electricity isolated contraction of a facial muscle in a man suffering anæsthesis and had the result photographed. According to the theory set forth in his "Mécanisme de la Physionomie Humaine" (1862), often contraction of one muscle suffices to express an emotion; each affective state produces one local modification. Thus, according to him, the frontal muscle is the muscle of attention, the superior orbital of the eyelids is the muscle of reflection, the pyramidal the muscle of threatening, the great zygomatic the muscle of laughter, the superciliar the muscle of pain, the triangular of the lips the muscle of contempt, and so on. But Duchenne limited himself to establishing the facts, therein following the example of Johannes Müller, who declared the expression of emotions to be a fact wholly inexplicable. Darwin went further. Applying the comparative method and resting upon laborious researches, he investigated the origin of the different mechanisms of expression; he sought to explain why contraction of a given facial muscle is necessarily associated with a certain determinate state of the mind.

While these minute observations were lacking, any attempt to explain the mechanism of attention would have been premature. How, indeed, explain a mechanism the parts of which you know nothing about? Let us see what is known about attention in its two forms—applied to external objects (attention proper), or applied to interior occurrences (reflection).

Attention (for clearness' sake we will qualify it as *sensorial*) contracts the frontal muscle. This muscle occupies the whole frontal region: it has its movable insertion in the skin of the eyebrow, and its fixed insertion in the posterior part of the cranium. In contracting, it draws to itself the eyebrow, lifts it, and produces transverse wrinkles on the forehead: in consequence, the eye opens wide and is well lighted. In extreme cases the mouth opens wide In children and in many grown persons keen attention causes protrusion

*Maudsley, "Psysiology of the Mind."

of the lips—a sort of pouting. Preyer has sought to explain this play of physiognomy by an heredi tary influence. "All animals" he says, "direct their attention first to the search for food. The objects that may be reached by their lips, their feelers, their proboscis, and their tongue, are the ones they first examine. Thus, all search for food is accompanied by a preponderant activity of the mouth and its belongings. In the sucking young the mouth is elongated." And so we see an association between the first movements of the mouth and the activity of attention.

Reflection expresses itself in another manner, nearly the reverse of this. It acts upon the superior orbicular muscle of the eyelid, and pulls the eyebrow down. In consequence there are formed small vertical folds in the inter-superciliar space, the eye is veiled by the lid, or entirely closed, or it looks within. This wrinkling between the eyebrows gives to the physiognomy an expression of intellectual energy. The mouth is shut, as if to sustain an effort.

Attention adapts itself to what is without, reflection to what is within. Darwin explains by an analogy the way that reflection expresses itself; it is, he says, the attitude of difficult vision, transferred from external objects to internal happenings which cannot easily be made out.*

So far we have spoken only of movements of the face, but there remain those of the whole body—the head, the trunk, the limbs. It is impossible to describe them in detail, for they are different in different species of animals.† In general they consist of immobility, adaptation of the eyes, the ears, the touch, according to the circumstances: in short a tendency to unity of action, convergence. Concentration of the consciousness and concentration of the movements, diffusion of thoughts and diffusion of movements, go in couples. Consult the observations and calculations of Galton upon the subject. He studied the behavior of an audience of fifty persons listening to a dull lecture. The number of clearly discernible movements in the audience was very uniform, being 45 a minute, or on the average, one movement per head. Several times, the attention of the people having been awakened, the number of movements grew smaller; besides, they were less ample, less prolonged, shorter and more rapid.

In passing I anticipate an objection. As all know, attention, at least in its reflected form, is sometimes accompanied by movements. Many persons find that walking helps them out of a perplexity; others strike their forehead, scratch their head, rub their eyes, or keep moving arms or legs in a certain rhythm. This is an outlay, not an economy of motion; but it is an outlay that brings advantage. The movements so produced are not mere mechanic phenomena acting on the world without—they act also, through the muscular sense, upon the brain, which receives them as it receives all other sensorial impressions, and they augment the brain's activity. A rapid walk, a ride on horseback, quicken the flow of thoughts, and of speech; as Bain says, they produce a mechanic intoxication. The experimental researches of Mr. Féré, which we cannot reproduce here,* supply numerous instances of the force-producing action of movements. We stretch our arms and legs to make ready for work, that is we awaken the motor centers. Passive movements given to paralyzed limbs have in some cases, by reviving former motor impressions, brought back lost power of action. And be it

*For details see Darwin, "Expression of the Emotions," Chapt. X; Preyer, "The Mind of the Child;" Mantegazza, "La Physionomie," Chapt. XVI.

†A good study of expression and attention in animals is found in Ricardi, "Saggio di Studi e di Osservazioni intorno all' Attenzione nell' Uomo e negli Animali. Modena," 1887.

*See his work, "Sensation et Mouvement."

noted that these movements augment the mental activity instead of concentrating the attention; they simply furnish matter to it. It is a preliminary operation.

This objection put aside, we have next to determine the true rôle of movements in attention. So far we have simply been describing them—at least the principal ones. Let us state the question in the clearest and simplest terms:

The movements of the face, the body, the limbs, and the respiratory modifications which accompany attention, are these, as usually supposed, merely effects, signs? Or are they, on the contrary, *the necessary conditions, the constituent elements, the indispensable factors of attention?* The second proposition we maintain unhesitatingly. Totally suppress the movements, and you totally suppress attention.

Though just now we cannot establish this proposition save in part—the study of voluntary attention, which is reserved for another chapter, will exhibit it to us under a new aspect—nevertheless, since we here touch an essential point in the mechanism of attention, it is well to look at it for a while.

The fundamental rôle of movements in attention consists in *sustaining* the state of consciousness and in *reinforcing* it. As this is a question of mechanism, it is best to look at its physiological side, and to inquire what goes on in the brain considered both as an intellectual organ and as a motor organ.

1. As an intellectual organ, the brain serves as a *substratum* to the sense-perceptions (in sensorial attention), and to images and ideas (in reflection). *Ex hypothesi*, the nerve-elements in active function-ment furnish work superior to the average. Attention certainly causes an intense innervation, as is proved by the many psychometric experiments in which it plays a part. "An idea in activity," says Maudsley, "produces in the nervous elements a molecular change which is propagated along the sensitive nerves to the periphery or at least to the sensorial ganglia, the sensibility of which is thus increased. From this propagation of molecular action to the ganglia it results that the muscles relating to the sense affected become by reflex action in some degree tense and augment the feeling of attention. In Hartmann's opinion, attention "consists in material nerve-vibrations," in "a nerve-current traversing the sensitive nerves, directed from the center to the periphery." But there is another element, nor is it the least important.

2. As a motor organ, the brain plays a complex rôle. First, it starts the movements that accompany the sense-perception, image, or idea; then these movements, often intense, return to the brain by way of the muscular sense, as sensations of movement; these augment the quantity of available energy, which on the one hand serves to support or to reinforce the consciousness, and on the other hand goes back to its starting-point as a new movement. Thus there is a going and coming between the center and the periphery, in both directions, and from the one to the other back again, and so on. The intensity of the consciousness is but the subjective expression of this complex work. But it were a gratuitous hypothesis in flat contradiction to the teaching of experience, to suppose that the intensity of the state of consciousness can persist without these organic conditions. The simple-minded spectator who grows tired at the opera because he cannot understand the music at all, is all attention when a sudden change of the scenes occurs; that is, when the visual impression brings about an instantaneous adaptation of the eyes and of the whole body. Without this organic convergence, the impression would vanish speedily "In the preponderant reaction on the sensitive parts, the original source of the *processus*," says Wundt, "con-

sists essentially the difference between attention and voluntary movement. In the latter, the central excitation takes its main direction toward the muscles; in attention, the muscles do not concur save in subordinate sympathetic movements;"* in other words, a reflection of movements is produced.

If, then, we compare the ordinary state with the state of attention, we find in the first, faint representations and but little movement; in the second, a vivid representation, energetic and convergent movements, and furthermore reverberation of the movements produced. It makes little difference whether the last element be conscious or no.

It will perhaps be said: admitting this reaction of the movements upon the brain, still there is nothing to show that at bottom they are anything but a simple effect of attention. Three hypotheses are possible: attention (state of consciousness) is the cause of the movements; or it is their effect; or it is first the cause, then the effect.

I prefer not to choose between these three hypotheses, which have a value purely logical and dialectic, and to state the question otherwise. Under the above form, it is quite im penetrated—without appearing to be so—with that traditional dualism which it has cost psychology so dear to rid itself of; and it amounts after all to asking whether in attention the soul acts first on the body or the body on the soul. That riddle is not for me to solve. Physiological psychology sees only two internal states, differing from each other by their proper qualities as well as by their physical concomitants. If the intellectual state produced is faint, brief, without recognizable expression, there is no attention. If it is strong, stable, well defined, and translated by the physical modifications mentioned above, there is attention. We maintain that attention does not exist *in abstracto*, as a purely interior happening: it is a concrete state, a psycho-physiological complex. In our spectator at the opera, do away, *ex hypothesi*, with the adaptation of the eyes, head, body, limbs, the changes in the respiration and the cerebral circulation, and the reaction, conscious or unconscious, of all these phenomena upon the brain; what remains of the original whole, thus despoiled and emptied, is no longer attention. If aught remains, it is an ephemeral state of consciousness, the shadow of what was before. This example, extravagant as it is, will, we hope, make our meaning clearer than would a long discourse. The motor manifestations are neither effect nor causes, but elements: with the state of consciousness which is their subjective side, these *are* attention.

Still the reader is not to take all this as anything more than a rough outline, a provisional view of the subject, which will be completed further on. Thus, we say nothing of the feeling of effort, because it is very rare in spontaneous attention, if perchance it is found there at all; but the rôle of the movements is of such importance that we revert to it again and again.

3. The state of surprise or astonishment is spontaneous attention magnified; a few words about it. Though frequent in daily life, it has been forgotten by psychology. Still I find in Descartes's "Traité des Passions" (Pt. 2, Art. 70) this definition: "Admiration is a sudden surprise of the soul, which leads it to consider with attention objects which to it seem rare and extraordinary. Thus, it is caused, first, by the impression in the brain which represents the object as rare and consequently as worthy of being regarded highly, then, by the movement of the spirits, which are by this impression led to tend with great force toward the place in the brain where it [i. e. the impression] is, there to strengthen and sustain it: as also

*"Physiologische Psychologie," p. 723-24, first ed.

they are by it disposed to pass thence into the muscles which serve to keep the organs of the senses in the same situation in which they are, to the end that it may be still maintained by them, if it has been formed by them.' This passage is worth the trouble of being meditated.* If it be read with care, it will be found that, allowance made for difference of language nearly all the elements we have endeavored to point out in the mechanism of spontaneous attention, are here clearly enumerated: the augmentation of the nervous influx in consequence of the impression, its partial diversion toward the muscles, the action of these muscles to "sustain" and "strengthen" it. Note, in passing, that Descartes's procedure is that of physiological psychology, not that of the spiritualist† psychology which wrongfully enough claims descent from him.

Surprise, in a higher degree astonishment, is a shock produced by what is new and unexpected: for example, if a stay-at-home whom I suppose to be in his own town 500 miles away should enter my room.

From the mental side there is little to be said of it. It belongs to the group of Emotions, and in its stronger form it is a commotion. Properly speaking, it is not so much a state as an interval between two states, a brusk rapture, a *lacuna*, an hiatus. At the instant of the shock the prior polyideism stops short, because the new state bursts in like a giant upon the "struggle for life" between the two states of consciousness. Little by little, the new state is classed, brought into connection with others, equilibruim tends to be reestablished; there has been time for adaptation. The intellectual element resumes the mastery over the emotional. Still it is very probable that, in surprise, feeling is in excess, cognition in defect.

On the physical side, the symptoms are an exaggeration of the spontaneous attention.

"Attention is manifest by a slight elevation of the eyebrows: when it passes into the state of surprise, the eyebrows are raised much more energetically; the eyes and also the mouth open wide. . . . The degree to which both are opened is in proportion to the intensity of the surprise felt. *

This raising of the eyebrows is an instinctive act, for it occurs in those born blind: it causes the eyes to be opened very rapidly. As for the opening of the mouth, that allows of a deep inspiration such as we always take before any great effort.

As we have said, surprise is spontaneous attention magnified. This proposition I think is fully justified. What is best demonstrated is the affective causes of spontaneous attention; for there is an insensible gradation from this to surprise, astonishment, stupefaction, finally to fright and terror, which are affective states of great intensity.

Coming back thus to our starting-point we may now see that the origin of attention is very lowly and that its earliest forms are tied down to the the most imperious conditions of animal life. Attention had at first only a biological value. The habit of psychologists to restrict themselves to voluntary attention and even to its higher manifestations, concealed this origin.

We may declare *a priori* that if attention has for its cause affective

* The passage runs thus in French: "L'admiration est une subite surprise de l'âme, qui fait qu'elle se porte à considérer avec attention les objets qui lui semblent rares et extraordinaires. Ainsi, elle est causée premièrement par l'impression qu'on a dans le cerveau qui représente l'objet comme rare et par conséquent digne d'être fort considéré; puis, ensuite, par le mouvement des esprits qui sont disposés par cette impression à tendre avec une grande force vers l'endroit du cerveau où elle est pour l'y fortifier et conserver: comme aussi ils sont disposés par elle à passer de là dans les muscles qui servent à retenir les organes des sens en la même situation qu'ils sont, afin qu'elle soit encore entretenue par eux, si c'est par eux qu'elle a été formée."

† Here used in the sense of "opposed to *materialism*." As employed in philosophy, the words, spirit, spiritual, spiritualist, spiritualism, etc., have nothing to do with the belief, or the practice of those who in our day are commonly called spiritualists, but who ought to be called spiritists, and their system practice, spiritism. [*Translator.*]

* Darwin's "Expression of the Emotions."

states, which themselves have for their cause tendencies, wants, appetites, it is in the last analysis referable to that which lies deepest in the individual—the instinct of self-preservation.

A rapid examination of the facts will enable us better to see that the possibility of being attentive is an advantage of the first order in the struggle for life; but we must quit man and descend lower, very low down in the animal scale. I put aside the strictly rudimentary forms of psychic life, as lending themselves too readily to conjecture. To produce attention, there is need at least of a few developed senses, a few clear perceptions, and a sufficient motor apparatus. Riccardi, in the work already cited, finds in the *Arthropoda* the first clear exoression of attention.

An animal so organized that the impressions of the outer world shall be to it all eqnivalent and shall all in his consciousness stand upon the same plane, no one predominating nor winning for itself an appropriate motor adaptation: such an animal were ill equipped for self-preservation. I set aside the extreme case—where the predominance and adaptation should be in favor of hurtful impressions; for an animal so constituted must needs perish, being an illogical organism, an embodied contradiction. The usual case remains, to wit, predominance of useful sensations, viz., those connected with nutrition, self-defense, propagation of its kind. The impression of prey to be captured, enemies to be avoided, a female to be from time to time impregnated, fixes itself in the consciousness of the animal, accompanied by adapted movements. The attention is at the service of and dependent on the animal's needs; always associated with the sense that is best developed, whether it be touch, sight, hearing, smelling, according to the species. There it is seen in all its simplicity, and there it is most instructive. It was needful to descend to these rudimentary forms to understand the reason of its power—it is a condition of life,—and it will preserve the same character in the higher forms where, being no longer a factor of adaptation to the physical environment, it will become, as we shall see, a factor of adaptation to the social environment. In all the forms of attention, from lowest to highest, there is *unity of composition.*

Even among the higher animals attention loses its narrow, material character. The vast majority of animal species are confined within this narrow circle: nutrition, self-defense, propagation, sleep, and herein they expend their activity. The more intelligent possess a superabundant activity which they expend in play—a manifestation so important that many authors regard it as the source of art. To this need of luxury corresponds an attention for luxury. The dog whose master amuses it in a certain way becomes attentive when it sees him getting ready; and a good observer of children, Sikorski, has shown that their activity and their attention are developed especially in their sports.*

CHAPTER III.

VOLUNTARY ATTENTION.

Voluntary or artificial attention is a product of art, of education, of imitation, of training. It is grafted on spontaneous or natural attention, and in it finds the conditions of its existence, as the graft does in the trunk into which it is inserted. In spontaneous attention, the object acts by its intrinsic power; in voluntary attention, the subject acts by extrinsic, that is, super-added powers. Here the end is no longer set by chance or circumstances; it is willed, chosen, accepted, or at least submitted to; the question is one of

* "Revue Philosophique," April, 1885.

adapting oneself to it, of finding the fit means of maintaining the attention: hence this state is always accompanied by some feeling of effort. The maximum of spontaneous attention and the maximum of voluntary attention are strictly antithetic, the one proceeding in the direction of the strongest attraction, the other in that of the strongest resistance. They are the two poles, and between them are all the degrees possible, with a point where, in theory at least, the two forms coalesce.

Though voluntary attention is nearly the only form of attention that has been studied by psychologists, and though most of them know of no other, still its mechanism is not better known. In endeavoring to get some notion of it, we propose to inquire, first, how voluntary attention is produced—to investigate its genesis; then we will study the feeling of effort which accompanies it, and finally the phenomena of inhibition which, in our opinion, play a chief part in the mechanism of attention.

I. The process by which voluntary attention is produced is reducible to this one formula: Rendering attractive by artificial means that which is not so by nature; giving an artificial interest to things which have not a natural interest. I use the word "interest" in its vulgar sense as equivalent to the periphrase "what keeps the mind alert." But the mind is kept alert only by an action agreeable, disagreeable, or mixed, of objects upon it, that is, of affective states. But in this case the feelings which keep up the attention are acquired, superadded, not spontaneous as in its primary manifestations. The whole matter is thus reduced to finding effective motives; if these be wanting, there is no voluntary attention.

Such is the process in general terms; in practice it varies *ad infinitum*.

To understand aright the genesis of voluntary attention, the best way is to study children and the higher animals. The simpler the examples the better.

In the first period of its life, the child is incapable of any but spontaneous attention. It fixes its gaze only on brillant objects, or on the face of its mother or its nurse. Toward the end of the third month, it explores the field of vision, gradually resting its eyes upon objects less and less interesting (Preyer). It is the same with the other senses; the transition is made little by little from what concerns most to what concerns least. The fixing of the gaze, which later becomes intense attention, is translated outwardly by the more pronounced contraction of sundry muscles. The attention is accompanied by a certain affective state called by Preyer the "emotion of astonishment." In its highest stage, this state produces temporary immobility of the muscles. According to Sikorski, "astonishment, or rather the emotion which accompanies the psychic process of attention, is above all characterized by momentary suspension of respiration —a phenomenon that strikes one especially who is accustomed to the rapid respiration of children."* It is well-nigh impossible to tell at what period the will first makes its appearance. Preyer thinks he has observed it in the fifth month, but under the impulsive form; as a power of inhibition it makes its appearance a good deal later.

While the psychic life remains thus in the tentative stage, attention, i. e., the transference of the mind from one object to another, is determined only by their power of attraction. The birth of voluntary attention, which means the possibility of holding the mind to non-attractive objects, can be brought about only by force, under the influence of education, whether that come from man or from things. That which comes from man is

* "Le Developpement Psychique de l' Enfant." (*Revue Philosophique*, Avril, 1885).

easiest to demonstrate, but is not the only education.

A child refuses to read; it is incapable of keeping its mind fixed on letters that have no attraction for it; but it looks eagerly at pictures in a book. "What do these pictures say?" Its father answers: "When you are able to read, the book will tell you." After several talks such as this, the child surrenders, sets about the task at first languidly, then it acquires the habit of study, and finally shows an eagerness that has to be checked. That exhibits the genesis of voluntary attention. On a desire that is natural and direct is grafted a desire artificial and indirect. Reading is an operation that has no direct attraction, but as a means it possesses an attraction—a borrowed attraction—and that suffices: the child has made the first step. Another example: A six-year-old child *habitually very inattentive*, one day of its own accord goes to the piano to repeat an air that pleased its mother; its exercise lasted more than an hour. The same child, at the age of seven, seeing its brother busied with his vocation tasks, went and sat down in its father's library. "What are you doing?" asked its nurse, surprised to find the child there. "I am doing a page of German," was the answer; "it is not very amusing, but it is a nice surprise I mean to give mama"* Here we see another case of voluntary attention, grafted on a sympathetic feeling, not on an egoistic one as in the first example. The piano, the German did not spontaneously call forth attention: they awaken and sustain it by a borrowed force.

Universally, at the beginning of voluntary attention, we find this mechanism ever the same, with innumerable variations, resulting in success, half-success, or failure: it is ever taking up natural motives, diverting them from their direct end, and using them, if possible, as means to another end. Art bends nature to its purposes, and hence I call this form of attention *artificial*.

Without pretending to enumerate the different motives artifice sets at work to call up and to confirm voluntary attention, that is, to give to the end to be attained a power of action that it does not possess naturally, I note in the formation of voluntary attention three chronological periods.

In the first, the educator can act only upon the simple feelings: he employs fear in all its forms, egoistic tendencies, the attraction of rewards, the tender and sympathetic emotions, the innate curiosity that is as it were the appetite of the intelligence and which is found in all in one degree or another.

In the second period, artificial attention is awakened and sustained by feelings of secondary formation: self-love, emulation, ambition, interest (in the sense of advantage), duty, etc.

The third period is that of organization: attention is awakened and sustained by habit. The schoolboy in his class-room the artisan in his shop, the clerk in his office, the shopkeeper behind his counter, all would generally prefer to be elsewhere; but self-love, ambition, interest, have by repetition produced a lasting habitude. The acquired attention is become second nature; art has its perfect work. The one fact of being placed in a certain posture, amid certain surroundings, decides all the rest; attention is produced and sustained not so much by present causes as by prior ones; habitual motives have taken the place of natural motives. Those who withstand education and discipline never reach the third period: in them voluntary attention is produced rarely, intermittently, and cannot become a habit.

It is not necessary to show in detail that in animals the transition from spontaneous to voluntary attention takes place in like manner under the influence of education, of training; but the trainer has at his disposal only restricted means of action,

*B. Perez, "L'Enfant de 3 à 7 Ans," p. 108.

simple in their nature. He acts through fear, privation of food, violence, kindness, caresses, and so at last causes the animal to form habits, by artifices makes it attentive. As among human beings, so among animals some are educable, others refractory. "A man," says Darwin;* "who trains monkeys to act in plays, used to purchase common kinds from the zoölogical society, at the price of £5 for each; but he offered to give double the price, if he might keep three or four of them for a few days in order to select one. When asked how he could possibly learn so soon whether a particular monkey would turn out a good actor, he answered that it all depended on their power of attention. If, when he was talking and explaining anything to a monkey its attention was easily distracted, as by a fly on the wall, or other trifling object, the case was hopeless. If he tried by punishment to make an inattentive monkey act, it turned sulky. On the other hand, a monkey which carefully attended to him could alway be trained.

Thus then, we find at the root of attention nothing but affective states, attractive or repulsive tendencies. In the spontaneous form there are no other causes but these. It is the same with the voluntary; but here the feelings are of a more complex nature, of slow formation, drawn by experience from the primary tendencies, while voluntary attention is still in its genetic period, before it is organized, fixed by habit, if you take from the schoolboy self-love, emulation, fear of punishment; if you make the shopkeeper and the artisan rich; if you give to the clerk a competence in the early days of his career: all their attention toward distasteful work vanishes, for there is no longer aught to call it forth or maintain it. This account of attention is, I confess, very complex, but it is conformable to facts. If we are to believe most of the psychologists, voluntary attention—the only form that counts for anything with them, though it is only a derivative, an acquired form—comes into being fully equipped. "It is subject to the superior authority of the Ego. I yield it or I withhold it as I please; I direct it in turn to several points; I concentrate it upon each point as long as my will can stand the effort"* if that is not a conventional and fanciful description; if the author derives it from his own experience, I cannot but admire it. But in truth one must needs be bereft of all power of observation and blinded by foregone conclusions, not to see that voluntary attention, in its stable form, is a state difficult to maintain, and that many a one fails to reach that bourne.

But if as we have endeavored to show, the higher form of attention is the work of the education we have received from our parents, our instructors, from our environment, and of the education we have acquired ourselves, the explanation merely places the difficulty farther back; for our educators have merely acted upon us as others had acted upon them, and so on for generations. Hence we have here no explanation of the primordial genesis of voluntary attention.

How then did it arise? Out of necessity, under the pressure of need, with the progress of intelligence. *It is a perfected instrument and a product of civilization.* The same progress by which, in the moral order, the individual has passed from the reign of instinct into that of interest or of duty; in the social order, from primitive savagery into the state of organization; in the political order, from almost absolute individualism into constituted government: by that same progress man has, in the intellectual order, passed from the reign of spontaneous attention to that of voluntary attention. The latter is both cause and effect of civilization.

* "Descent of Man," § 116 (No 74, Humboldt Library)

* "Dictionnaire Philosophique," 2d. ed.

In the preceding chapter it was remarked that in the state of nature, both for animal and for man the possibility of spontaneous attention is a factor of prime importance in the struggle for life. So soon as, for whatever causes—lack of game, density of population, a poor soil, more warlike neighbors, etc.—a horde must needs either die out or adapt itself to more complex life-conditions—that is, go to work—voluntary attention also becomes a prime factor in this new form of the struggle for life. When man became capable of applying himself to a task having no direct attraction but accepted as a means of livelihood, then voluntary attention made its appearance in the world. Hence it arose under the pressure of necessity and of the education which we get from our surroundings.

It can easily be shown that before civilization voluntary attention was not or appeared only by flashes, without duration. The laziness of savages is notorious; travelers and ethnologists are agreed upon this point, and so abundant are the proofs and instances that it is useless to cite them. The savage loves the chase, war, gaming—chance, the unknown, the unforeseen in every form; but continuous work he knows not, or despises. The love of work is a sentiment of secondary origin that goes with civilization. Now work is the concrete form of attention. Continuous labor is repulsive even to half-civilized tribes. Darwin asked of some Gauchos whom he found given up to drink, gaming, and theft, why they did not work. One of them answered: "The days are too long." "The life of the primitive man," says Herbert Spencer,* "is passed mainly in the pursuit of beasts, birds, and fish, which yields him a gratifying excitement; but though to the civilized man the chase gives gratification, this is neither so persistant nor so general . . . Conversely, the power of continued application, which in the primitive man is very small, has among ourselves become considerable. It is true that most are coerced into industry by necessity, but there are sprinkled throughout society men to whom active occupation is a need—men who are restless when away from business and miserable when they eventually give it up; men to whom this or that line of investigation is so attractive that they devote themselves to it day after day, year after year hardly giving themselves the rest necessary for health."

Since in order to live even after the manner of savages, disagreeable work has sometimes to be done, such work, as we know, falls upon the women, who, while the man sleeps, labor for fear of being beaten. Hence it is possible, though at first it seems a paradox, that voluntary attention first began with the woman.

Even in nations for ages civilized there exists a large number of creatures incapable of continued labor—the vagabonds, professional thieves, prostitutes. The new Italian school of criminal statisticians discern in this fact, rightly or wrongly, cases of atavism. The great majority of civilized people have adapted themselves sufficiently to the exigencies of social life: they are in some degree capable of voluntary attention. But small indeed is the number of those of whom Spencer speaks—for whom it is a necessity; few are they who profess and practice the maxim *stantem oportet mori*. Voluntary attention is the sociological phenomenon. When we consider it as such, we understand its genesis and its feebleness.

It has now, we think, been shown that voluntary attention is an adaptation to the conditions of a higher social life, that it is a discipline and a habit, an imitation of natural attention, which is its starting-point and its basis.

* "Data of Ethics," Chapt. X (Humboldt Library No. 9.)

2. So far we have been considering in the mechanism of attention only the external pressure of motive forces and of the environment which transfer it from one form to the other. We now come upon a much more difficult question, namely, the study of the inner mechanism whereby a state of consciousness is laboriously maintained, in spite of the psychological struggle for life which ever tends to do it away. The relative monoideism which consists in a preponderance of a certain number of internal states adapted to one end to the exclusion of all others, does not need to be explained in the case of spontaneous attention. A state, or group of states, predominates in the consciousness because it is by far the stronger; and it is by far the stronger because, as we have seen, all the tendencies of the individual conspire to favor it. In the case of voluntary attention, particularly in its more artificial forms, the contrary holds. By what mechanism, then, is this state sustained?

We need not inquire how the state of voluntary attention is produced in daily life. It comes into existence, like any other state of consciousness, at the bidding of circumstances; but that which distinguishes it from them is that it is maintained. If a schoolboy having little liking for mathematics recollects that he has a problem to work out, that is simply a state of consciousness; if he goes to work and persists, that is a state of voluntary attention. In this possibility of holding the attention, of inhibition, is found the entire problem.

How can we produce an inhibition? Here we enter upon a question well known in physiology, almost unexplored in psychology. That we have the power, in many cases, of arresting [inhibiting] the movements of sundry parts of our body, is proved by constant experience. But how is the equivalent of this inhibition produced in the mental order? Were the physiological mechanism of inhibition better known, the answer might perhaps be less obscure.

The fundamental property of the nervous system is that it transforms a prime excitation into a movement. That is reflex action, the type of nerve activity. But we know further that some excitations may prevent, or slacken, or suppress a movement. The most familiar instance, the one earliest investigated, is the suspension of the heart movements by irritation of the pneumogastric. Since the discovery of this, due to the brothers Weber in 1845, physiologists have with great ardor studied cases where excitation of a nerve prevents a movement or a secretion. Pflüger showed that the splanchnic nerve has an inhibitory action upon the small intestine. It was later shown that the movements of the stomach and of the whole intestinal tube are subject to inhibition. Claude Bernard refers to the same cause the action of the vaso-dilator nerves. Finally, this power of inhibition belongs not only to the spinal chord and the bulb, for it exists in the brain. Setschenof was the first to hold that the middle brain (optic thalami) has an inhibitory influence upon the inferior portions of the cerebro-spinal axis. Many authors in recent times have referred the phenomena of hypnotism to a cortical inhibition. And according to Brown-Séquard, "inhibition is a power possessed by nearly every portion of the central nervous system and by a considerable portion of the peripheric nervous system."

To explain this "negative reflexation" many different theories have been proposed, but we need not describe them.* Still it is to be noted that Ferrier, in his "Functions of the Brain," first called attention to an action of the moderating centers, which he places in the frontal lobes. According to Ferrier, the recalling

* For the history of the question down to 1879, see Hermann, "Handbuch der Physiologie," vol. II., pt 2, p. 33 *et* seqq. For the more recent theories, see, S. Lourie, "I Fatti e le Teorie della Inibizione." Milano, 1888.

of a thought depends upon the excitation of the motor element that enters into its composition; attention depends upon restriction of movement: there is repression of diffusion abroad and increase of diffusion within. Excitation of the motor centers, protected against diffusion abroad, expends its force inwardly; there is repressed excitation of a motor center. For localizing these moderating centers in the frontal lobes his principal reasons are these: Intelligence is proportioned to the development of attention; it is also proportioned to the development of the frontal lobes. Irritation of these lobes does not produce any motor manifestation, hence they are moderating agencies, and expend their energy in producing changes in the centers of actual motor execution. Removal of them does not cause any motor paralysis, but a mental degenerescence which results in a loss of the power of attention. The frontal lobes are imperfectly developed in idiots, whose power of attention is very small. The frontal regions become weaker and weaker in animals as the grade of intelligence grows lower. We may add that lesions of the frontal lobes greatly lessen and often quite destroy the power of control.* The author further declares that "as to the physiological basis of this faculty of control, only theoretical views can be put forward."

Though the theory that the phenomena of inhibition take place in special organs has become almost classical, many recent authors, on the ground of their experiments, have held that "motor action and inhibition have their seat in the same elements."† "Whenever we excite a nerve," says Beaunis, "there are produced in that nerve two kinds of modifications in opposite directions. Be it a motor nerve: in that nerve there will be a putting in action that will be expressed by a tremor of the muscle; but besides this phenomenon, which is the one most easily seen and best studied, there is also produced an opposite state which will tend to efface the tremor, or to prevent its coming."* The motor process appears sooner than the process of inhibition and lasts for a shorter time. A first excitation causes a maximum tremor; but at the second excitation the inhibitory action which tends to come on, diminishes the amplitude. In one of Wundt's experiments, "When a nerve is excited by a constant current, there is produced in the anode an inhibiting wave, recognized by a diminution of excitability in the nerve, and which is propagated slowly from the two sides of the anode: at the same time there is produced at the cathode a wave of excitation which is propagated from both sides of the cathode with a greater velocity and intensity. An excited nerve is thus pervaded at one time both by a wave of inhibition and by a wave of excitation, and its excitability is only the algebraic resultant of these two opposite actions."

On this hypothesis, then, every excitation produces in the nerve substance two modifications, one positive, the other negative—a tendency on the one hand to activity, on the other a tendency to inhibition of this activity; the ultimate result is simply the resultant of these opposite actions, so that now impulsion, anon inhibition predominates.

We have set forth very summarily nearly all that physiology teaches us with regard to the mechanism of inhibition, and we shall have occasion to profit by it. Let us go back to the psychological study.

*Compare the work "Diseases of the will" (Humboldt Library No. 52). Quite recently an American neurologist, Alex. Starr, in 23 cases of lesion of the frontal lobes, found in one-half of the patients the following mental trouble, viz.; loss of the faculty of control, change of character, impossibility of fixing attention. "Brain," January, 1886, page 570.

†Wundt, "Untersuchungen zur Mechanik der Nerven und Nervencentren," 1871, 1876, and "Psychologie Physiologigue," vol. I., chapt. vi.; Beaunis, "Recherches Expérimentales sur les Conditions de l'Activité Cérébrale et sur la Physiologie du Nerf." Paris, 1884. Beaunis more than any other physiologist dwells upon the importance of inhibitory actions for psychology.

*Op. cit., p. 97.

The power of voluntary inhibition, whatever its *modus operandi*, is a secondary formation; it appears relatively late, as do all manifestations of a high order. Volition in its positive, impulsive form, the volition which *does*, comes first in chronological order. Volition in the negative form, which *prevents*, appears later—according to Preyer, toward the tenth month, under the lowly form of inhibition of the natural evacuations.

But how do we produce an inhibition? No satisfactory answer can be made. Nevertheless it is to be remarked that here our position is precisely the same as with regard to the opposite question—How do we produce a movement? In positive volition the "I will" is commonly followed by a movement; that is, there is first a putting in action, in the brain, of motor images or appropriate motor *residua*, a transmission of the nervous influx through the radiatio medullaris cerebri to the corpora striata, the lower stratum of the cerebral peduncle, to the bulb, then, after decussation, to the spinal cord, to the nerves, finally to the muscles.

In negative volition the "I will" is usually followed by an inhibition: the anatomical and physiological conditions are less known; on the hypothesis given above they are hardly different from those of the preceeding case. But in both cases consciousness knows directly only two things: the departure and the arrival, the "I will" and the act produced or inhibited. All the intermediate states escape it, and it knows them only of acquired knowledge and indirectly. Such being the sum of our actual knowledge, we must content ourselves with declaring as a fact that, just as we have the power of beginning, continuing, and increasing a movement, so we have the power of suppressing, interrupting, and diminishing a movement.

These general considerations lead us to one positive result at least, to wit, that an act of volition, whether impulsive or inhibitive, *acts only upon muscles and through muscles*; that consequently if the mechanism of attention is motor, as we maintain, then in all cases of attention there is a play of muscular elements, of movements whether actual or in the nascent state, upon which the power of inhibition acts. We have no power of action (whether impulsive or inhibitive) save upon the voluntary muscles; that is our sole positive conception of will. Of two things then one has to be chosen: either to find muscular elements in all manifestations of voluntary attention, or to give up all explanation of its mechanism and to restrict ourselves to saying what it is.

Attention applies itself voluntarily to sense-perceptions, images, or ideas; or, to speak more precisely and without metaphor, the state of monoideism may be sustained voluntarily by a group of sense-perceptions, images, or ideas adapted in advance to an end. We have to determine the motor elements found in these three cases.

1. As regards sense-perceptions no difficulty exists. All our organs of perception are both sensorial and motor. To perceive with our eyes, ears, hands, feet, tongue, nostrils, there must be movement. The more motility in any organ, the more exquisite is its sensibility; the less the motility, the more obtuse the sensibility. Nor is this all: without motor elements perception is impossible. As we have already said, if one keeps his eyes fixed upon an object, soon his vision becomes confused, and then fails him. Apply the tips of the fingers to a table without pressure, and in a few minutes the contact is no longer perceived. A movement of the eyes, or of the fingers, however slight, reawakens perception. Consciousness is not possible except through change; change is not possible save through movement. We might discourse at length on this subject, for though the facts are perfectly evident and of

everyday experience, psychology has so disregarded the rôle of movements that at last it forgot that they are a fundamental condition of knowing, being the instrument of the fundamental law of consciousness, which is relativity, change. Enough has been said to justify this absolute formula: No movement, no attention.

The rôle of movement in sensorial attention admits of no doubt. The watchmaker who studies minutely the works of a watch, adapts his eyes, hands, body: all other movements are suppressed. In laboratory experiments for studying voluntary attention, this state of concentration by inhibition of movements attains at times an extraordinary height. Of this we will speak later. The reader may recall the observations of Galton stated in the preceding chapter, upon the movements produced in a tired audience. Attention therefore means concentration and inhibition of movements. Distraction means diffusion of movements.

Voluntary attention may also act upon the expression of emotions, if we have strong reasons for not giving outward expression to a feeling, and a power of inhibition sufficient to prevent it; but it acts only on the muscles and on the muscles alone; all else escapes it.

So far we have considered the question from its easier side. We come now to that purely internal form known as *reflection*. This has for its subject matter images or ideas. Thus we have to find in these two groups of psychic states motor elements.

2. "It does not at first view seem evident," wrote Bain as early as 1855, "that the retention of an image in the mind is the work of the voluntary muscles. What are the movements produced when I represent a circle, or when I think of St. Paul's? An answer cannot be made to this question save by supposing the mental image to occupy in the brain and the rest of the nervous system the same place as in the original sensation. As there is a muscular element in our sensations, particularly in those of the higher order, as touch and hearing, that element must in one way or another find its place in ideal sensation, in recollection." Since 1855, the question of the nature of images has been studied closely and with good results, and has been solved in the same sense.* For most of the old school psychologists, the image was a sort of phantasm without fixed seat, existing in the soul, differing from sense-perception not in degree but in nature, resembling it "at most as a portrait resembles its original;" but for the physiological psychology there is between sense-perception and image identity of nature, identity of seat, and difference only of degree. The image is no photograph, but a revival of the sensorial and motor elements that constituted the perception. As its intensity increases, the image approximates more and more to its starting-point, and tends to become an hallucination.

If we restrict ourselves to the motor elements of images (and these alone interest us here) it is plain that since there is no perception without movement, the latter leaves in the brain motor residua (motor images, motor intuitions), just as impressions on the retina or on the skin leave sensorial impressions. Had the motor apparatus no memory, images, or residua, no movement could be learned and made habitual: all would have continually to be learned anew. There is no need of reasoning to prove this. Experience is ever teaching that movement is inherent in the image and contained therein. The celebrated experiment of Chevreul with a pendulum may be regarded as the type of this sort of facts. Is there need of any more? People throw

*Consult Taine, "On Intelligence," Book II.; Galton, "Inquiry into Human Faculty," pp. 83-114; Charcot, "Leçons sur les Maladies du Système Nerveux," vol. III.; Binet, "Psychologie du Raisonnement," chapt. II.; Ballet, "Le Langage Intérieur et les Diverses Formes de l'Aphasie."

themselves into gulfs through fear of falling into them, cut their throats with razors through fear of cutting their throats; people are "mind-readers" because they are able to "read" muscular states: and the explanation of it all is the elementary psychological fact that *every image contains an element of movement.* True, the motor element has not always these enormous proportions, but it exists at least in the nascent state; just as the sensorial image has not always the vividness of hallucination, but is simply outlined in the consciousness.

3. It is easy to prove the existence of motor elements in images; the question of general ideas or concepts is more difficult. It is to be remembered that physiological psychology has given very little study to ideology, and that this needs to be studied anew from the standpoint of the date of actual experience. For this task the study of sense-perception and images has prepared the way. I have no intention to treat here episodically so broad a question. I simply propose, by way of showing the bearings, to distribute general ideas in three great categories, viz.:

Those which result from the fusion of *like* images, without the aid of words;

Those which result from the fusion of *unlike* images, with the aid of words;

Those which are reducible to a word, accompanied by a vague *schema*, or even without any concomitant representation.

I do not take into account the regulator concepts [*concepts régulateurs*], namely time, space, cause, the study of which would carry us too far. Let us see if each of these three categories contains motor elements upon which attention can act.

a. The first category comprises the general ideas of space in the rudest sense, those found in the higher animals, infants, and deaf-mutes before the use of analytic language. The operation of the mind is limited to seizing very striking resemblances and so forming *generic images*—a term more precise than "general ideas." This operation seems closely analogous to the process by which Galton, by superposing several photographs obtains the composite portrait of a family, that is, accumulation of resemblances and elimination of slight differences: but to maintain, as many have done, that this process explains the formation of general ideas is to defend an untenable thesis; it explains only the lowest grade of these, since it can deal only with strong resemblances. Now do these generic images comprise a motor element? It is very difficult to say, and in any case it is useless, for it is not at this stage of mental life that voluntary reflection appears.

b. The second category comprises the greater number of the general ideas that serve for the current uses of thought. In a complete study of the subject we should have occasion to establish an ascending coördination of groups rising from the less to the more general, in other words, exhibiting the power of discerning resemblances fainter and fainter, analogies less and less numerous. All the steps of this ascent are seen in the history of mankind, The Fuegians have no abstract terms. The American Indians have terms to denote the white oak and the black oak; but they have no word for oak in general. The Tasmanians have a term for each species of trees, none for tree in general; *a fortiori*, none for plant, animal, color, etc.* Not to dwell upon these different phases, what have we in mind when we think these general ideas? First, a word, which is the fixed element: with it, an image less and less complex, less and less clear, in proportion as we rise in generalization. This image is an "extract." It is formed by a process which the mind employs even to represent to

*Lubbock, "The Origin of Civilization," chapt. IX; Tylor, "Primitive Culture," vol. 1., Chapt. VII.

itself an *individual* image. In fact, a representation of Peter, of Paul, of my dog, of any concrete thing fully known by me, is simply an extract from multiplied perceptions that I have had, and which have given me this under different aspects. In the representation of an individual image there is a struggle between the prior images of the object as to which shall have the ascendant in the consciousness. In the conception of a general idea there is a struggle between divers generic images as to which shall prevail. It is an "extract" of the second or third degree. Thus is formed a nucleus around which oscillate elements vague and obscure. My general conception of man or dog, if it persist for ever so short a time in consciousness, tends to assume a concrete form: it becomes a white man or a negro, a spaniel or a bulldog. The motor element is represented mainly by the word—to that we will return. As for the images, or extracts of images attached to the word, it were difficult to tell what in them remains of the movements included in the original sense-perceptions.

c. In the preceding category, in porportion as the ideas become more general the rôle of the images becomes less and less conspicuous, and the word more and more preponderant, till at last it stands alone. Thus we have this progressive series: generic images without words, generic images with words, words without images. In the last stage we find purely scientific concepts. Does the word exist alone in the mind at this supreme period of abstraction? I unhesitatingly adopt the affirmative. I cannot enter into details, which would carry me beyoud my subject; I content myself with observing that if actually there is not anything under the word, there is, there must be a potential knowledge, the possibility of a cognition "In actual thought," says Leibnitz, "we are wont to omit explanation of the signs, knowing or believing that we have this explanation at command; but this application or explication we do not judge to be actually necessary This method of reasoning I call blind, or symbolic. We employ it in algebra, in arithmetic, in fact universally." The acquiring of numeration by children, better still by savages, shows how the word, at first attached to objects, next to their images, by degrees becomes detached from these and stands independent. Finally, it is like fiduciary money (bank notes, bank checks, etc.), presenting a like utility, and like dangers. Here the motor element cannot be found save in the word. The recent researches referred to above, have shown that the word does not exist in all individuals in the same form. For some it consists mainly in articulatory states. Stricker, in his work "La Parole et la Musigue," describes, from his own experience a perfect type of this. For others it consists mainly in auditive images: this is *internal speech* well described by V. Egger. Others, much fewer, think by the aid of words read or *written*.*

These persons are "visuals." Among the majority of men all these elements act in unequal proportions. But universally the word that is uttered in a loud voice, the sign purely internal, rests upon some form of original sense-perception and consequently comprises motor elements.

That the motor elements included in general ideas of all these catagories are often very faint is not to be doubted. And this accords with the fact of common experience that abstract reflection is for many persons impossible and for nearly all persons difficult and fatiguing.

We have dwelt long upon this portion of our subject because it is the least investigated, the most difficult, the most exposed to criticism.†

*A curious instance of this is published in the "Revue Philosophique" for Jan. 1885, page 119. See also Ballet, *opus citatum*, Chapt. III.

† The study of a large number of normal or of morbid cases, we have said, has led to the knowledge of several types: motor, auditive, visual, according to the group of images dominant in each

But some reader will say, "We admit that there are motor elements in sense-perceptions, images, and, in less degree, in concepts. But that does not prove that attention acts upon these and by these, that it is a motor mechanism." True, there is no decisive observation or experment to be cited upon this point The crucial experiment would consist in seeing whether a man deprived of all external and internal motility, and of that only, would still be capable of attention. But no such experiment, is possible. Nothing at all like it is found in the morbid cases that we shall consider later. Still, it may be remarked that it is impossible to reflect when one is running at full speed, even if one runs merely for running's sake. A multitude of instances show that there is antagonism between a large expenditure of movement and the state of attention. It is true that people exercise attention while walking rapidly and gesticulating; but here we have a work of invention rather than of concentration, and the surplus nerve-force is expended in different ways. In short, it is evident that attention is an inhibition, and this inhibition cannot be produced save by a physiological mechanism which prevents the expenditure of real movements in the sensorial attention, and of movements in the nascent state in reflection; for the movement produced is a restitution to without, a vanishing of the state of consciousness, the nerve force which produces it being transformed into a motor impulsion. "Thought," says Setschenof, "is a reflex action reduced to its first two thirds;" or as Bain expresses it more elegantly, "Thought is a refraining from speaking or doing."

To conclude, let us see what is to be understood by the current expression, "voluntarily to direct one's attention to an object." and consider what then takes place, "What takes place then," says Maudsley, "is simple excitation of certain nervous currents of ideation and maintaining them in activity till they shall have brought into the consciousness by the irradiation of their energy all the associated ideas, or at least as many ideas as can be put in action in the momentary state of the brain . . . It hence appears that the force which we call attention is rather a *vis a fronte* then a *vis a tergo*—. . . Consciousness is the re-

individual, to say nothing of the ordinary or indifferent type. The one who thinks words by articulating them without hearing them (Stricker), he who thinks words by hearing them without articulating them (V. Egger), and he who thinks words by seeing them written, without hearing them or articulating them, represent irreducible types. That cuts all discussion short. Each is right in what concerns himself and his like; he is wrong if he generalizes without restriction.

It is to be wished that the work done with regard to images and the different forms of language were done also for general ideas. It is probable that there also we should find irreducible types. Thus, Berkeley to me seems to think general ideas under the *visual* form. Whoever will read attentively certain passages (too long to quote) of the famous Introduction to his "Treatise on Human Nature," who shall study them not as a theory of general ideas, but as psychological evidence, as a psychological confession, will conclude that for Berkeley the general idea was a vision.

"The idea of man," he says, "that I can form for myself must be the idea of a white man or a black man, a man straight or bent, big or little or of middle size. I cannot by any effort of thought conceive of the abstract idea described above"—i. e. of a color neither red, nor blue, nor green, etc., and yet is a color. On the other hand, to me the Nominalists seem to think general ideas under the purely *auditive* form. The famous theory which makes universals mere *flatus vocis* (Roscelin, Hobbes, *et alii*) appears to me to be susceptible of two interpretations. Taken literally it is nonsense. The pure *flatus vocis* is a word of a language one knows nothing whatever about, a word not associated with any idea, and which consequently is just a sound, a noise. It is hardly probable, that sane thinkers would have maintained the thesis in the form usually credited to them. I offer another interpretation. The Nominalists are unimaginative, algebraic minds [*des esprits secs, algébriques*] for whom the word is enough, without summoning up any image; in them there is no other representation but that of the sound. From this to Berkeley is a long way.

Stricker, who is a pure "motor," who cannot think a word without articulating it, and who is as little an auditive as man can be, says: "I must needs attach something (*sic*) to every word so that it may not appear to me as a dead term, as a term in a language unknown to me. Whenever there occur to my mind words such as 'immortality' or 'virtue' I explain them usually to myself not by words but by visual images. At the word "virtue," for instance, I think of some female form; at the word 'bravery' I think of a man armed," and so on. (*Opus citatum*, p. 80, 81). This conception of abstract and general ideas may be regarded as the opposite of Nominalism. In medicine it is said that there are no diseases, only diseased persons; so there are no general ideas, only minds that think in different ways. Instead of proceeding pnilosophically, i. e., seeking to reduce all to unity, it were time to proceed psychologically, i. e. determining the principal types. If that were done many a dispute would come to an end of its own accord.

sult, not the cause of attention. In the current language of psychology this proposition is reversed and the cart is put before the horse; for in reflection the question is not of directing consciousness or attention to an idea, but of giving to an idea sufficient intensity so that it will impress itself in consciousness."*

A doubtful point still remains. If we concede that the general mechanism of attention is motor, and that in the special case of voluntary attention it consists chiefly in an act of inhibition, the question remains, How is this inhibition produced, and on what does it act? The question is a difficult one and we can do little beyond stating it; nevertheless it is better to attempt an answer, though only a conjectural one, than to appear to elude the difficulty.

It will be perhaps not unprofitable to look for light in a similar class of phenomena though of less complex kind.

Reflex actions, whether those which are natural and innate or those which are secondary, acquired, fixed by repetition and habit, are produced spontaneously, unhesitatingly, without effort, and may be continued a long time without fatigue. They call into action those elements in the organism which are necessary for their production, and their adaptation is perfect. In the strictly motor order they are the equivalents of spontaneous attention. which itself is an intellectual reflex action, involving neither choice, nor hesitation, nor effort, and it can be continued for a long time without fatigue.

But there are other kinds of movement, more complex and artificial, for instance, writing, dancing, fencing, all bodily exercises, the mechanic trades, etc. Here the adaptation is not natural, but has to be acquired by hard effort. It requires choice, experiment, effort, and at first is accompanied by fatigue. Daily observation proves that at first there are produced a great many useless movements: thus, the child learning to write moves arms, eyes, tongue, head, etc. The end to be attained is to prevent this diffusion and by means of appropriate associations and disassociations to produce the maximum of useful work with the minimum of effort. The reason is that there are no isolated movements, and that a contracting muscle acts on its neighbor muscles, often on many of these. One attains the end after repeated attempts by some lucky chance—awkward persons slowly or not at all, those who are handy, speedily. But the mechanism is ever the same: it consists in reinforcing certain movements, coördinating them in simultaneous groups or in a series, while the others are suppressed—*inhibited.*

Voluntary or artificial attention proceeds in the same way. When one prepares to enter this state, he sees states of consciousness coming up in groups or in series, for states of consciousness are never isolated any more than are movements. Among them many do not help the main purpose, or even take us away from it. Then, states of consciousness that are useless or harmful have to be suppressed: if possible a large part of our task consists of this negative work by which the intruders are shut out of the consciousness or reduced to their minimum intensity. How is this done? Either we must abandon all explication, or we must admit an act of inhibition exercised over the motor elements of these states of consciousness. In such cases we have a very clear sense of effort made. And whence could that come if not from the energy expended in producing the acts of inhibition, for the ordinary course of thought, left to itself, is exempt from that feeling. If it be objected that in this view the fundamental mechanism of voluntary attention remains hidden, we reply that the fundamental mechanism of every volition is also hidden. Only the two extreme terms, the beginning and the end, enter the consciousness: all the rest belongs to the physiologi-

*"Physiology of the Mind."

cal domain, whether it be a question of doing or hindering, of producing a movement or an inhibition.

Attention is a momentary, provisional state of the mind, not a permanent power like sensibility or memory. It is a form (the tendency to monoideism) impressed upon a *materia* (the ordinary course of states of consciousness): its starting-point is either in the chance condition of circumstances (spontaneous attention), or in the positing of an end determined before hand (voluntary attention). In both cases affective states, tendencies must be awakened. There we see the primal *direction*. These lacking, all fails; if they are vacillating the attention is instable; if they do not persist attention vanishes. But a state of consciousness having thus become preponderant, the mechanism of association comes into play in its manifold forms. The work of *direction* consists in choosing appropriate states, keeping them (by inhibition) in the consciousness so that they in turn may proliferate, and so on by a series of choices, inhibitions, and reinforcements. Attention can do no more; it creates nought, and if the brain is barren, if the associations are meager, it functions in vain. Voluntarily to direct the attention is for many persons an impossibility, difficult for all.

III. As everyone knows by experience, voluntary attention is always accompanied by a feeling of effort which is directly proportioned to the time attention is kept up and to the difficulty of maintaining it. Whence comes this feeling of effort, and what is its meaning?

Attentional effort is a particular case of effort in general, of which the most familiar manifestation is that which accompanies muscular work. Three opinions have been held with regard to the origin of this feeling:

1. It is of central origin: it is prior to movement or at least simultaneous; it proceeds from within outward; it is centrifugal, efferent; it is a feeling of energy deployed; it does not, as is the case with sensation properly so called, result from an exterior influence transmitted by the centripetal nerves. (Bain).

2. It is of peripheric origin: it is posterior to the movements produced; it proceeds from without inward; it is afferent; it is the sense of energy that *has been* deployed; it is, like all sensations, transmitted from the periphery of the body to the brain by the centripetal nerves. (Charlton Bastian, Ferrier, W. James, and others).

3. It is both central and peripheric: there is such a feeling of force exerted, or a feeling of innervation, and there is also a feeling of movement effected; it is first centrifugal, then centripetal. (Wundt). This mixed theory seems also to be that of Johannes Müller, one of the first to study the question.

The second thesis, which is the most recent, seems to be the best founded. It has been set forth with great fullness by W. James in his monograph "The Feeling of Effort" (1880), and the thesis of the feeling of energy deployed, prior to movement, is there criticized with great acumen. In discussing the facts one by one, the author has shown that, in cases of paralysis of a portion of the body, or of an eye, if the patient has the feeling of an energy deployed though the member remains motionless (which seemingly justifies the thesis of a feeling of central innervation anterior to movement), the reason is because there is really a movement produced in the other half of the body, in the corresponding member, or in the eye that is not paralyzed. Hence he infers that this feeling is a complex afferent state arising out of contraction of the muscles, extension of the tendons, ligaments, and skin; from compressed articulations, closed glottis, tight-shut jaws, etc.; that in a word it is, like all sensations, of peripheric origin. Even

for those who will not accept this view as settling the matter, it is certain that it explains the facts far more satisfactorily and in a way more in accordance with the general laws of physiology, than does the hypothesis which refers this feeling to the motor nerve discharge, the motor apparatus being insensible in the centripetal direction.

Let us now consider the special case of attentional effort. The old school psychologists contented themselves with simply determining its existence, but they do not explain it. They speak of it only in vague phrases, calling it a "state of the soul" an hyperorganic manifestation. In it they see "an action of the soul upon the brain to call it into action." Fechner, I think, was the first (1880) to attempt precisely to localize the different forms of attention, by referring them to determinate parts of the organism. Hence the following passages seem to me worthy of reproduction as showing an attempt at an explanation:

"The feeling of attentional effort in the various sense organs seems to me to be simply a muscle-sense (Muskelgefühl) produced by putting in action, by a sort of reflex act, the muscles related to the different sense organs. The question then arises: To what muscular contraction is the attentional effort related, when we strive to recall anything? My inward sense gives me a clear answer upon this point. I experience a very distinct sensation of tension, not in the interior of the cranium, but as it were a tension and a contraction of the skin of the head and a pressure from without inward over the whole cranium, evidently caused by a contraction of the muscles of the skin of the head. In an illness I once suffered, during which I could not stand the slightest effort of continuous thought (and at that time I was not committed to any theory), the muscles of the skin, in particular those of the occiput, were very plainly in a state of morbid sensibility whenever I tried to reflect."

In the following passage Fechner describes this feeling of effort, first in sensorial attention, then in reflection:

"If we transfer our attention from the domain of one sense to that of another, we immediately experience a definite sense of change of direction—a feeling hard to describe but which any one may reproduce experimentally. We call this change a tension diversely localized.

"We feel a tension directed forward in the eyes, directed to one side in the ears, and differing with the degree of attention, accordingly as we regard attentively or listen attentively to something: hence it is that we speak of the effort of attention. We are very clearly sensible of the difference when we change rapidly the direction of the attention from the eye to the ear. So too the feeling is localized differently accordingly as we wish carefully to smell, taste, or touch an object.

"Whenever I would represent to myself very clearly a recollection or an image, I have a feeling of tension much like that of attentive vision or hearing. This quite analogous feeling is localized in a manner totally different. For whereas in attentively looking at real objects as well as in contemplating consecutive (mental) images, the tension is felt in front, and in directing attention to the other sensorial domains, the only thing that changes is the direction toward the exterior organs, the rest of the head giving no feeling of tension: on the contrary, in the case of recollection and of images, I have a consciousness that the tension withdraws extirely from the external organs of sense, and seems rather to occupy the part of the head filled by the brain. If I wish, for instance to represent vividly to myself an object or a person, they seem to come up to me all the more vividly the more I strain my attention not forward, but so to speak backward."*

*"Elemente der Psychophysik," vol. II., p. 475, 490.

Since the publication of Fechner's work the researches of Duchenne already mentioned, as also those of Darwin and of the authors who have studied the movements of expression, have thrown much light upon the subject. Note also the rôle of the respiratory movements, of which Fechner does not speak. So important are they, that in certain cases they of themselves produce the feeling of effort, as Ferrier has shown by a very simple experiment. If you stretch an arm, holding the index finger in the position needed for drawing the trigger of a pistol, you can, without actually moving the finger, experience the feeling of energy deployed. Here then is a clear case of the feeling of energy deployed, without any real contraction of the hand-muscles, and without any perpcetible bodily effort. That is Bain's view. "But," says Ferrier, "if the reader recommences the experiment and attends to the state of the respiration, he observes that his consciousness of effort coincides with a fixation of the pectoral muscles, and that in proportion to the sum of energy which he feels set in action by him, he keeps the glottis shut, and actively contracts his respiratory muscles. Let him place his finger as before and *keep on respiring* all the time, and he will find that however strongly he may direct his attention upon the finger, he will have not the slightest trace of consciousness of effort, until the finger itself has been actually moved, and then the consciousness of effort is referred locally to the muscles that act."

To sum up, we see always muscular contractions. Even when we stand motionless, we find, if we observe closely, that intense reflection is accompanied by a beginning of speech, of movements of larynx, tongue, lips. In those who do not belong to the "motor" type, and who therefore are least favorable to our view, there is a state of ideal audition or of ideal vision: the eye, though shut, is fixed on imaginary objects. Czermak, and after him Stricker have shown that if, after contemplating inwardly the image of an object supposed to be very near, we pass suddenly to the mental vision of a very distant object, we feel a change in the innervation of the eyes. In real vision, in a like case, one passes from the state of convergence to that of parallelism of the visual axes, that is, he has to innervate the motor muscles of the eye in a different way. The same operation, fainter, in the nascent state, takes place in the interior vision which accompanies reflection. Finally, in all persons and in every case there are modifications in the respiratory rhythm.*

We can now answer the question already raised: what is the origin of the feeling of effort in attention, and what is its meaning?

It has its origin in those physical states so often enumerated, and which are the necessary conditions of attention. It is simply their echo in consciousness. It depends on the quantity and quality of the muscular contractions, on organic modifications, etc. Its starting-point is in the periphery, as is the case with all other sensations.

It means that attention is an abnormal state, not lasting, causing rapid exhaustion of the organism; for when the effort is over there is fatigue, and after the fatigue comes functional inactivity.

There remains one obscure point.

*Mr. Guge, of Amsterdam, has recently given the name of *aprosekie* (Gr. ἀ privative, and προσέχειν, to attend) to incapacity to fix attention on a definite object, in consequence of a diminution of the nasal respiration due to certain circumstances, such as adenoid tumors in the pharyngo-nasal cavity, polypus of the nose, etc. A child of seven years had failed to learn at school through an entire year more than the first three letters of the alphabet. After undergoing an operation for its adenoid tumor, the child in one week learned the entire alphabet. Some gymnasium students, similarly affected, were unable to learn anything. They felt that every effort to fix their attention produced headache and vertigo. They could without fatigue read a phrase six to ten times, but without understanding what they read, though they were not thinking of anything else. This circumstance differentiates this state from ordinary distraction of mind. ("Biologisches Centralblatt," Jan, 1, 1888).

When we pass from the ordinary state to the state of sensorial attention or of reflection, there is produced an augmentation of work. The man who is exhausted by a long walk, or by a strong mental effort, or who succumbs to sleep at the end of a day's labor; the convalescent recovering from a serious illness, in a word, all persons who are debilitated, are incapable of attention because, like other forms of work, it calls for a reserve capital that may be expended. In the transition from the state of distraction to that of attention, therefore, there is a transformation of tension force into *vis viva*, of potential into actual energy. Now this is an *initial* moment very different from the moment of the effort felt, which is an effect. This remark I make in passing, but do not dwell upon it. The examination of this question cannot be made with advantage till we shall have studied our entire subject.

4. Experimental research upon voluntary attention has confirmed and made more definite certain conclusions which in any case follow from an exact comprehension of the subject. Such research is either direct or indirect, accordingly as it investigates attention in itself and in its individual variations, in the normal and in the morbid state, or as it investigates it as the means, the instrument of other researches upon the duration of sense-perceptions, associations, judgment, choice, etc. Attention is in fact the fundamental psychic condition of nearly all psychometric researches.*

Obersteiner, in whose view attention is essentially a fact of inhibition, finds that generally it requires a longer time in the ignorant than in cultivated persons, in women than in men, who by their mode of life develop the power of inhibition, in the aged than in persons in middle age and youth: the fact indicates no doubt a less rapid functional development.

A series of experiments made upon the same person gave us the mean in the normal state 133 σ,* in the case of headache 171 σ, in that part of fatigue and sleepiness, 183 σ. In a patient at the onset of general paralysis the mean time was 166 σ; in the second stage of that disease, while the state of the patient was still entirely compatible with investigation, the result obtained was 281 σ up to as high as 755 σ. Again, Mr. Stanley Hall, who had the good fortune to find a subject able in the hypnotic state to react correctly, met with a very perceptible diminution of the time, ranging from a mean of 328 σ (normal state) to 193 σ (hypnotic state)—a result that was to be anticipated in view of the monoideism peculiar to hypnotism.

Wundt and Exner have made other experiments on the normal individual. At times the subject is taken in the state of distraction, the impression to which he is to read coming unforeseen and without being determined in advance. Again the impression is determined so far as concerns its nature and energy, not as to the time at which it is to be produced. Anon the impression is completely determined (as to its nature and time), a signal notifying the patient that the impression is about to follow. In this progressive advance from indetermination to determination, the reaction time keeps ever declining, as we might have anticipated. Thus while in the case of mental distraction it may rise to the enormous figure 500 σ, in the second case it falls to 253 σ, and with the signal to 76 σ.

These experiments present in its simplest form the state called *expectant attention*, or *pre-attention*. They suggest some considerations corroborative of what has been already said.

If in expectant attention we con-

*For particulars about experiments, consult "Experimental Researches on Attention" in "Brain," Jan. 1879; Wendt, "Psychologie Physiologique," vol. II., ch. xvi; Exner, in Hermann, "Handbuch der Physiologie," vol. II., part 2, p. 283 *et seq.*; J. Stanley Hall, "Reaction Time and Attention in the Hypnotic State" ("Mind" Apr. 1883).

*σ =1000th part of a second.

sider only the *intellectual* side, we find it to be a preparatory stage in which is called forth the image of an event foreseen or presumed. The state of monoideism is constituted, so that the real event is but the reinforcement of the preëxisting representation. In some experiments two almost simultaneous impressions are produced, and the question is, which is prior in time. If the impressions are of different kinds, one auditive (a stroke on a bell), the other visual (an electric spark), there is a tendency to consider as prior either the stronger impression or that toward which the attention was directed while pursuing these researches. Wundt was able at will, according to the direction given to his attention, to see now the one again the other as prior. When the two excitations are of the same kind, we notice distinctly only the first, and the second passes unnoticed.

If we consider the *motor* aspect of expectant attention, we see that it produces a preparatory innervation of the nerve centers and muscles, which at the least shock may be converted into a real impulsion. Thus the representation can by itself produce a reaction, without external cause.

This explosive state is produced especially in cases where the expected impression is indeterminate, in cases that might be called expectant attention in general. The motor innervation is distributed among all the sensorial domains: there is then produced a feeling of disquietude and discomfort, of tension so that the falling of a body or any laboratory mishap brings about an automatic reaction.

When the expected impression is fully determined, the motor innervation has its way traced in advance; instead of being diffused, the tension is localized. The reaction time may be null or even a negative quantity.

When the reaction has to be made by different processes or in response to different excitations, there must be produced a change in the centers which shall effect a change in the direction of the nerve routes: it is a very fatiguing state.

We must also mention the experimental researches of N. Lange upon the oscillations of sensorial attention. In the stillness of night the ticking of a watch situate at some distance sometimes is not heard, again is reinforced; the same is to be said of the sound of a water fall; and similar oscillations have been observed with regard to visual and tactual sensations. These variations are subjective, not objective. Must we, as is commonly done, attribute them to fatigue of the sensorial organ? Lange thinks not; according to him they have their cause in the brain and are due to oscillations of attention. When one attends to two simultaneous excitations, one optical the other acoustic, if the oscillations are of peripheric origin they must be independent of each other. But such is not the case: the two kinds of oscillations never coincide; they are always separate by a clearly defined interval. What is the cause of this periodicity of oscillations? According to Lange, it is the oscillation of the images which accompany sense-perception. The reinforcement existing in the attention results from the fact that to the actual impression is added the image of a prior one. Sensorial impression sion would seem to be an assimilation of the real impression, which remains motionless, with the prior image, which is subject to oscillations.*

We find, in short, that attention in no wise resembles a pure activity, that it is tied to clearly determined physical conditions, that it acts only through these and depends upon these.

CHAPTER IV.

MORBID STATES OF ATTENTON.

To complete this study of attention,

*Lange, "Beiträge zur Theorie der sinnlichen Aufmerksamkeit und der activen Apperception," in "Philosophische Studien," 1887.

it remains for us to examine morbid cases. I do not purpose to attempt a pathology of attention: the title were too ambitious and the undertaking premature; but these are facts overlooked by psychology, though they are familar; and these it is well to review. The reader will see their importance for a better understanding of the mechanism of normal attention.

In current language, to attention is opposed the state of "distraction," but this word, both in French* and other languages is used in different senses. It denotes states of mind apparently much alike but which at bottom are contrary to one another. These are said to be "*distraits*" whose intelligence is incapable of being fixed with any degree of stability, who are ever passing from one thought to another, according to every passing change of humor or of the circumstances. It is a perpetual state of mobility and is the very reverse of attention: it is frequently seen in children and in women. But the word "distraction" is also applied to cases quite different from this. People who are absorbed by one idea, and "distracted" from things around them, give little opportunity to outer occurrences to take hold of them; these glance off them and do not penetrate their minds. Such persons seem incapable of attention just because they are highly attentive. Many scholars are famous for their "distraction" in this sense, and so numerous are the instances of this that it is needless to cite any. While the "*distraits dissipés*"† are characterized by an incessant wandering from one thought to another, the "*distraits-absorbés*" are characterized by the impossibility or the great difficulty of passing from thought to thought. These are riveted to their thought—they are prisoners that do not want to escape. In fact, their state is a mild form of the morbid condition which we will study later under the name of "fixed idea."

But these every-day manifestations, these different forms of "distraction" are after all not so instructive as are cases clearly pathological. Without attempting anything like a scientific classification of these, we will endeavor to group them according to a natural system. Here our starting-point must be the normal attention, and we have to note its several varieties and deviations. Some authors have studied the disordered states of attention and have referred them to the different types of mental disease, such as hypochondria, melancholia, mania, dementia, etc. This procedure not only leads to endless repetitions, but furthermore is subject to this grave defect that it does not place in a clear light the fact of attention. It is studied not in itself, but as a symptom. On the contrary, for us it is a primary fact; all the rest is accessory. The morbid forms must be referred to the main trunk—the normal state—and their relations must be clearly understood: on this condition alone can pathology afford us any instruction.

If, as has been already said, attention is the *temporary* dominance of an intellectual state or group of states, with natural or artificial adaptation of the individual, we can distinguish these deviations:

1. *Absolute* predominance of one state or group of states, which becomes stable, fixed, and which cannot be dislodged from the consciousness. We have not now merely an antagonist of spontaneous attention, its one function being to govern it: on the contrary, we have a destructive, tyrannical power which subjects all to itself, which permits development of thought only in one direction, which allows the current of consciousness to flow only in one narrow channel, and which sterilizes more or less whatever is outside its

*The remarks which follow apply to French rather than to English: nevertheless it has been deemed best to give them unaltered. *Translator.*

† The first class of *distraits* mentioned above.

domination. Illustrations of this are seen in hypochondria, and better still in fixed ideas and in ecstasy. These constitute the first morbid group, which I shall call *hypertrophy of attention.*

2. In the second group I shall class cases in which attention cannot be sustained, or even cannot exist at all. This state is owing to two principal causes. Sometimes the flow of thoughts is so rapid, so exuberant, that the mind becomes purely automatic. In this uncontrolled flood of ideas no one state is stable, no one state predominates; there is no center of attraction, even for a moment. Here the mechanism of association is in full play: it acts alone, with all its force, without any counterpoise. Instances of this are seen in some forms of delirium and particularly in acute mania. At other times, while the mechanism of association does not exceed the average of intensity, there is absence or diminution of the power of inhibition. Subjectively, this state implies impossibility or extreme difficulty of effort. There is no convergence whether spontaneous or artificial; the thoughts, are ever in flux, scattered, and unrelated, of this we see instances in hysterical subjects, in convalescents, in apathetic and insensible patients, in intoxication, in the state of extreme bodily or mental fatigue, etc. This lack of power coincides, in short, with all forms of exhaustion. This group we designate, in opposition to the other, *atrophy of attention.*

The first group of morbid states, it may be remarked in passing, has to do rather with spontaneous attention, the second rather with voluntary. The one is an evolution and is in the *plus* direction, the other is a dissolution and is in the direction of *minus.* Here pathology verifies what has already been said. Voluntary attention, like all things artificial, is precarious, vacillating. Disease does not transform it, but rather breaks it up. Spontaneous attention, like all natural forces, may be magnified beyond all limits, yet it is only transformed. Essentially, its nature is not changed; it is as when a light wind becomes a tempest.

3. The third group comprises not morbid forms of attention, but a congenital infirmity, as when spontaneous attention or *a fortiori* voluntary attention does not appear at all, or appear only by flashes. This is seen in varying degrees in idiots, imbeciles, the weak-minded, and the demented. After this rapid classification we proceed to details.

I. There is an almost insensible transition from the normal state to the most exaggerated forms of the fixed idea. Every one knows by experience what it is to be haunted by a musical air or by some trivial phrase that is ever recurring to the mind without assignable cause. That is the fixed idea in its least pronounced form. The state of preoccupation brings us to a higher stage: the thought of a sick person that one has to care for, of an examination to be passed, of a long voyage to be made—such thoughts act by repetition, but do not constitute a real "obsession" of the consciousness. Despite its intermittence, the thought is ever alive, and is ready at any moment to emerge suddenly out of the under-current of unconsciousness: it has more stability than any other thought, and its momentary eclipses do not prevent it from playing the principal part. In every sane person there is almost always one dominant thought which dominates his conduct—the thought of pleasure, money, ambition, his soul's salvation, and the like. This fixed idea which presists through life, save where it is superseded by some other, finally becomes a fixed passion—which proves once again that attention and all its modes depend upon affective states. The transformation of attention into a fixed idea is seen still more clearly in great men. "What is a great life?" said Alfred de Vigny. "A thought of youth realized in mature

age." For many a celebrated character this "thought" has been so absorbing, so dominating that one can hardly refrain from regarding it as morbid.

The transformation of spontaneous attention into a decidedly pathological fixed idea, is clearly seen in hypochondriacs. We can trace its evolution through all its stages—and the stages are many, ranging from the slightest form of preoccupation to complete obsession. Though this mental malady cannot germinate and grow except in a favorable soil, and though consequently it presupposes certain physical and mental conditions, it does not at the outset rise above the mean level of spontaneous attention: the exaggeration takes place only little by little. And it matters little whether the sufferings of the patient be real or imaginary: from the psychological, subjective point of view it is all one. As we know, the mere act of fixing the attention upon a portion of the body,—the heart, stomach, bladder, intestines—produces in consciousness unwonted sensations: an illustration of the general law that every vivid state of consciousness tends to actualize itself. Some men are peculiarly gifted in this respect. Sir Benjamin Brodie said that he could feel pain in any region of his body whatever, by strongly fixing his attention thereon. Now "fixing attention" means simply letting a given state continue or predominate. This predominance, at first quite harmless, grows by the very effects it produces. A center of attraction is formed which little by little gains the supremacy in the consciousness. It is then an unceasing preoccupation, a continual observation upon the state of each organ and the products of each function: in short we have a case of perfect hypochondria as it has been a thousand times portrayed.

But there are fixed ideas more extraordinary, more rare, which, because of their purely intellectual nature, are as it were the caricature of reflection. These are fixed ideas properly so called. They have been very carefully studied by sundry authors in our time.* Unfortunate the memoirs and collections of observations that we have upon this subject have hardly come from the domain of psychiatry, and hitherto psychology has profited little by them, at least as far as attention is concerned.

It is pretty well agreed that fixed ideas are to be classed in three great categories:

1. Simple fixed ideas of a purely intellectual kind, which usually are confined to the consciousness, or which have no outward expression save in insignificant acts.

2. Fixed ideas accompanied by emotions such as terror and anxiety (agoraphobia, *folie du doute*, etc.)

3. Fixed ideas of the impulsive kind, known as "irresistible tendencies," which express themselves in violent or criminal acts, as robbery, homicide, suicide.

Though there is no sharp line between the three classes, it may be said that the first has for its specific character a disordered state of the intelligence, that the second belongs rather to the affective order, and that the third depends upon a weakening of the will. The latter two will be rigorously excluded from our study, because they have to do with the pathology of the feelings and the will. It is best to deal with cases free from all foreign admixture, to such as are strictly comparable with the state of relative monoideism which we call attention.

Even when we restrict ourselves

*Westphal, "Ueber Zwangsvorstellungen (in "Archiv für Psychiatrie," 1878); Berger, "Grübelsucht und Zwangsvorstellungen" (*ibid.*, vol. VIII.); Krafft-Ebing, "Lehrbuch der Psychiatrie," and "Ueber Geistesstörungen durch Zwangsvorstellungen" ("Zeitschrift für Psychiatrie" vol. XXXV.); Griesinger, "Ueber ein wenig bekannten Psychopathischen Zustand" ("Archiv für Psych.," vol. I.:) Meschede, "Ueber Krankhafte Fragesucht" ("Zeitschr, für Psych., vol. XXVII.;) Buccola, "Le Idee Fisse e le loro Condizione Fisiopatologiche" (1880.; Tamburini, "Sulla Pazzii del Dubbio e sulle Idee Fisse ed Impulsive" (1883); Luys, "Des Obsessions Pathologiques" (Encéphale" 1883); Charcot et Magnan, "De l'Onomatomanie" ("Archives de Neurologie, 1885.)

to this group, instances of fixed ideas are not wanting. They have received different names according to their dominant characters. In some persons the fixed idea takes a mathematical form (arithmomania)—why have persons such or such a stature? why have houses such or such a size? trees such or such a height? and so on for every separate object. Oftener, a person keeps ever counting, adding, multiplying. "A certain woman who showed many symptoms of hysteria could not look into a street but at once she would involuntarily begin to count the paving stones, then those of all the streets of the town, of all the towns in Italy, and so on. If she saw a bag of wheat, straightway began in her brain the work of counting the grains of wheat in the town, the neighborhood, the whole country . . . She confessed that not only did she feel constrained by an irresistable force to make these odd calculations, but that these fixed ideas were so well organized that if while proforming the hard task she had to stop out of sheer inability to pursue it farther or from any other cause, she felt keen distress, nay she endured unspeakable bodily suffering."* I know of a young man who spends the greater part of his time in calculating the time of starting and of arrival of each train at each railroad station all over the world. He even makes a present of railroads to countries that have none, and regulates at his pleasure the imaginary traffic. He draws up highly complicated time-tables covering huge sheets of paper. He is a man of great intelligence.

Another form of the fixed idea consists in putting questions without end upon some abstract problem that the patients themselves hold to be incapable of solution. This the Germans call *Grübelsucht*, in English it goes by the name of "metaphysical mania." The interrogative form peculiar to it obtains for it in German the name of *Fragetrieb*. A man whose case was observed by Griesinger, could not hear the word "beautiful" without putting to himself, whether he would or no, an endless and inextricable series of questions upon the most abstruse problems of œsthetics. The word "being" put him in a quandary of metaphysical speculation. This man, who was highly educated, says of himself: "I am ruining my health in thinking continually of these problems which reason never can solve, and which, notwithstanding my strongest efforts of will, are ever wearying me . . . This metaphysical reflection is too continuous to be natural Every time that these thoughts come to me I strive to dismiss them and I try to persuade myself to pursue the natural course of thought, not to puzzle my brains with arguments full of obscurity, not to give myself up to meditating upon abstruse and insolvable questions. But I cannot withstand the continual impulsion, the unceasing fixed tendency which is ever present to me and leaves me no moment of quiet."*

I give one more illustration of the fixed idea, taken from Tamburini, because of its purely intellectual character: "A young law student, of neuropathic parentage, was dominated continually by thoughts about the origin, the why and the how of the circulation of bank notes. This thought kept his attention always strained, made it impossible for him to occupy his mind with any other, stood between the outer world and him, and strive as he might to rid himself of it, it was impossible for him to do it. Notwithstanding his long study of the subject and his many researches upon the problem, thinking himself unfitted for all other mental labor, he fell into such a state of sadness and apathy that he wanted to suspend his studies. . . . His sleep was insufficient and broken; often he lay awake for nights together, ever absorbed by his dominant

* Roncati, *apud* Buccola, *op. cit.*

* Griesinger, *op. cit.*

thought. A singular phenomenon must be noted. In consequence of his continual mental tension upon the problem of the bank notes, at last he came to have ever before his eyes pictures of bank notes, in all their different shapes and sizes and colors. The idea, ever repeated and impressed upon him with intensity, came to have a force of projection which made it equal to the reality. Still he was always fully conscious that the images before his eyes were but a play of his imagination." Appropriate medical treatment and a few very lucid explanations given by a professor improved his situation. "The veil that enveloped his mind, after it had been removed with regard to large notes, remained with regard to those of small value, those for fifty centimes for instance; the image of these continued to appear to him." At last all his troubles disappeared.

It will perhaps be said: "These people and their kind are madmen." True, they are not sane minds, but the epithet "madmen" is undeserved. They are persons debilitated, or who have lost mental balance. Mental co-ordination, always precarious and irritable, gives way at the slightest shock; but that is a loss of equilibrium, not a fall. Authors who have investigated the determining causes of fixed ideas, all reach the same conclusion—that it is a symptom of degenerescence. We might say: Not whoever will has fixed ideas. There is a prime condition always requisite, namely, a neuropathic constitution. It may be hereditary, or it may be acquired. Some persons are born of parents to whom they are indebted for the sad legacy of a degenerated organism. This is by far the more numerous class. The others are exhausted in consequence of their mode of life—by physical or mental fatigue, emotions, strong passions, sexual or other excess, anæmia, debilitating diseases, etc. Finally, the same result is reached by both routes. Hence the fixed idea, even in its simplest form, that which we are considering, and which appears wholly theoretical and confined within the field of intellectual operations, is nevertheless no purely interior occurrence, without physical concomitants. Quite the contrary, the organic symptoms accompanying it indicate a neurasthesis; these are, headaches, neuralgia, feeling of oppression, disorders of motility, of the vaso-motors and of the sexual functions, insomnia, etc. The psychic phenomenon of the fixed idea is but one effect among many of one same cause. Still, if it suffices for the physician to trace these mulitple manifestations to a single source, degenerescence, the task of the psychologist is much more difficult. In addition to the general cause, it is for him to find the special causes in each case. Why does such or such a form prevail with a given individual? Why does the fixed idea in one person take the form of counting, in another, of metaphysical speculation, and so on? What are the secondary causes which have given this direction or that? Each case would have to be studied separately. Supposing that this research can be successful, it were best to begin with the graver cases, those which we have eliminated. In reality, they are the more simple, and as some of them are related to a determinate organic apparatus (e. g. the fixed idea in some subjects of erotomaniacs) that would be a starting-point and a clue. But to apply direct to the intellectual forms of the fixed idea psychological analysis, were to condemn one's labor to failure. However, we have not to undertake that task here. Our one purpose is to examine more closely the mechanism of the fixed idea, to see wherein it resembles the mechanism of attention, and wherein it differs from it.

And to this we may answer straightway: Between the two there is no difference of kind, only of degree: the fixed idea has greater

intensity and above all greater duration. Take a case of spontaneous attention; suppose that we can by artificial means reinforce it and particularly that we can make it permanent: there the transformation into a fixed idea is complete; the whole train of irrational conceptions that attend upon the fixed idea and give it the false appearance of insanity, will be added of necessity, by the mere effect of the logical mechanism of the mind. The term "fixed idea" designates the principal part of the entire psychological state, but only a part—the center from which all sets out, to which all returns. The permanence of one image, one idea—that and nothing more—is a contradiction of the conditions of consciousness, which demands change. *Absolute* monoideism, if that exists, occurs if at all only in the highest forms of ecstasy, as we shall see later. The mechanism of the fixed idea consists in associations of states of consciousness in one only direction—associations at times loose and but little coherent, oftener held together by a close logical bond which expresses itself in never-ceasing interrogations.

Some authors, Westphal in particular, in noting the differences between the fixed idea and mental disorders qualified as "insanity," have made this important remark: "The fixed idea is a *formal* change in the process of ideation, not in its contents;" in other words, there is a change not in the nature, the quality of the idea, which is normal, but in its quantity, its intensity, its degree. To reflect upon the origin of things, or on the circulation of bank-notes, is a perfectly rational act, and that mental state is in no wise comparable with that of the beggar who thinks himself a millionaire or of the man who believes he is a woman. The "formal" disorder consists in the stern necessity which compels the association always to follow one path. As there are intermittences, momentary changes of direction, the patients, whose intelligence is quick and their cultivation of no ordinary degree, are fully conscious of the absurdity of their state: the fixed idea appears to them as a foreign body lodged in them which they are unable to rid themselves of; but it falls short of possessing them wholly, and remains an "aborted delirious idea."

This *formal* character of the fixed idea shows its close relationship to attention. Attention, as we have often said, is only a mental attitude. Perceptions, images, ideas, emotions are its subject-matter; it does not produce them, does but isolate them, reinforce them, bring them to the light; it is only a *mode*. Common speech itself draws a distinction between the ordinary form and the attentive form of states of the mind.

Hence I am fully disposed to agree with Buccola that "the fixed idea is attention in its highest degree—the uttermost term of its inhibitory faculty." There is no line of division, not even a fluctuating one, between them; and, to sum up, if we compare them with each other, here is what we find:

1. In both cases, we see predominance and intensity of a state of consciousness, only these are higher in the case of the fixed idea. This, by reason of its organic conditions, is permanent—it lasts; it has to do with a highly important psychological factor—time.

2. In both cases the mechanism of association is limited. This exceptional state lasts but a short time in attention; consciousness returns spontaneously to its normal state, which is a struggle for existence between heterogeneous states. The fixed idea prevents all diffusion.

3. The fixed idea presupposes—this is one of the usual effects of degenerescence—a notable weakening of the will, i.e., of the power to react.

There is no antagonist state that can reduce it. Effort is impossible or fruitless. Hence, the distressed

state of the patient, who is conscious of his impotence.

Physiologically, we may probably represent the condition of the fixed idea as follows: In the normal state, the whole brain acts: the activity is distributed. Discharges take place between one group of cells and another, and this is the objective equivalent of the unceasing changes of the consciousness. In the morbid state, some of the nervous elements only are active, or at least their state of tension does not pass to other groups. It is not necessary that the nervous elements should occupy a point or a limited region of the brain; they may be scattered if only they be closely associated for the common work. Whatever be their position in the cerebral organ, they are in fact isolated: all the disposable energy is accumulated in them and they do not communicate it to other groups: hence their exaggerated activity. There is a lack of physiological equilibrium, due probably to the state of nutrition of the brain centers.

Esquirol called the fixed idea a catalepsy of the intelligence. We may also compare it to a phenomenon of the motor system—contracture. A contracture is a prolonged constriction of the muscles; it depends upon an excess of irritability of the nerve centers: the will is powerless to break it up. The fixed idea has a like cause; it consists of an excessive tension, and the will has no control over it.

II. The fixed idea might be called the chronic form of hypertrophy of attention: ecstasy is its acute form. We have not to study in its entirety this extraordinary mental state. In another place* we have studied it on its negative side—abolition of will-power; we are now to consider its positive side—exaltation of the intellect.

To compare attention with ecstasy is nothing new: so great is the analogy between the two states that many authors have made use of attention in defining ecstasy. "It is," says Bérard, "a vivid exaltation of certain ideas which so absorb the attention that the sensations are suspended, the voluntary movements arrested, even the vital action often slowed." Michéa defines ecstasy as "profound contemplation, with abolition of sensibility and of locomotor power." A. Maury is still more explicit: "A mere difference of degree separates ecstasy from the act of strongly fixing an idea in the mind. Contemplation implies furthermore the exercise of will and the power of stopping the extreme tension of the mind. In ecstasy, which is contemplation carried to it highest power, the will, though it can produce the ecstatic state, is powerless to suspend it."*

As with the fixed idea, so in the state of ecstasy there are intermediate degrees. Persons who have great power of attention are able at will to isolate themselves from the outer world. Inaccessible to sensations and even to pain, they live temporarily in the special state called *contemplation*. The oft-quoted anecdote of Archimedes at the taking of Syracuse, whether true or false, is true at least psychologically. The biographers of Newton, Pascal, Sir W. Scott, Gauss, and many others, give instances of this rapture of the intellect.

"Before the discovery of chloroform, patients sometimes underwent serious operations without giving any sign of pain, and they would afterward declare that they had felt nothing, having concentrated their thoughts, by a strong effort of attention, upon some subject that engrossed them completely.

"Many martyrs have suffered torture with a perfect serenity, which, as they said, they had no difficulty in maintaining. Their entranced attention was so filled with the beatific visions that occurred to their rav-

*"Diseases of the Will," Chapt. VI. ("Humbolt Library," No. 52.)"

*Maury, "Le Sommeil et les Rêves," p. 235.

ished gaze, that corporal tortures caused them no pain."*

Political fanaticism has repeatedly produced similar effects. But everywhere and always it is strong passion that serves as the ground-work —showing once more that vivid and stable forms of attention depend upon the affective life and upon that alone.

Let us pass over the intermediate degrees and consider ecstasy proper, and let us dismiss all the other physical and psychic manifestations that accompany that extraordinary state, and look only at one particular fact —the extreme intellectual activity, with concentration upon one single idea. This is an intense, circumscribed state of ideation; the whole life is brought together in the thinking brain, where one single mental representation absorbs all. Still ecstasy, though in each individual it raises the intelligence to its highest power, cannot transform it. It cannot act upon a narrow and ignorant mind as upon a broad and highly cultivated one. Hence we may distinguish two categories of mystics. In some, the interior phenomenon consists of the apparition of a dominant *image* around which all else is concentered (the Passion, the Nativity, the Virgin Mary, etc.), and which finds expression in a regular series of movements and speeches. Instances: the cases of Marie Mærl, Louise Lateau, the ecstatica of Voray. In others—in the greater mystics—the mind, after traversing the region of images, attains the region of pure ideas, and there becomes fixed. I will endeavor to show, later, that this higher form of ecstacy at times produces complete, absolute monoideism, that is, perfect unity of consciousness—one sole state of consciousness, without any changes.

To trace this ascending process of the mind toward absolute unity of consciousness, whereof even the most concentrated state of attention is but a faint image, we have no need of probable hypotheses or of proceeding theoretically *a priori*. I find in "*El Castillo Interior*" of St. Theresa a description step by step of this progressive concentration of consciousness, which, starting from the ordinary state of diffusion, attains the state of attention, overpasses this little by little, and in some rare instances reaches perfect unity of intuition. The proofs I am about to give from St. Theresa are, it is true, restricted to one single case but one good observation is worth a hundred indifferent ones.* And this observation we may receive with full confidence. It is a confession made by command of the spiritual power, and it is the work of a very keen intellect and a very skillful observer, who knew well the use of words and used them with discrimination, for the expression of fine shades of meaning.

I beg the reader not to forget that here a Spanish woman of the 16th century analyzes her own mind in the language and in accordance with the ideas of her time: but what she says may be translated into the language of contemporary psychology. Such translation I attempt, with the purpose of showing this ever-advancing concentration, this progressive narrowing of the field of consciousness, described in accordance with a personal experience.

There is, says St. Theresa, a castle built out of one diamond of incomparable beauty and purity: to enter and to dwell therein is the aim of the mystic. This castle is within, in our souls; we do not have to go out of ourselves to come to it, yet the road is long and arduous. To reach it we must pass through seven stopping places: we come to it through seven degrees of "prayer." In the preparatory stage, one is still surrounded by a multiplicity of images, in the "life of the world"—which means that consciousness in this

*Carpenter, "Mental Physiology," Chapt. III.

*Probably others might be found by searching through the mystic literature of different countries. The passages here to be quoted are taken from "The Interior Castle," and a very few from the autobiography of St. Theresa.

stage takes the ordinary, the normal course.

The first stopping-place is reached through "vocal prayer." That is: Prayer uttered in a loud voice, articulate speech, produces the first degree of concentration, or brings the scattered consciousness into one tract.

The second stopping-place is that of "mental prayer," which means that the interiority of thought increases: inner speech takes the place of outer. Concentration becomes easier; the consciousness no longer requires the material support of articulated words, or of words heard, in order not to stray away.

The "prayer of abstraction"* is the third degree. Here, I confess, I find difficulty in translating. I fail to see in this anything but a higher form of the second stage, separated from it by a slight shade of difference such as can be appreciated only by the consciousness of the mystic.

So far, there is activity, movement, effort—all the faculties are still in play: but now one has "no longer to think much, but to love much." In other words, the consciousness is passing from the discursive to the intuitive form, from plurality to unity; it tends to be no longer a radiation around a fixed point, but one state of enormous intensity. And this transition is not the effect of a capricous, arbitrary will, nor of the mere movement of thought left to itself; it requires the impulsion of a strong love, the "coup de grâce," that is, the unconscious coöperation of the whole being.

The "prayer of quietude" brings one to the fourth stopping-place and then "the soul no longer produces, it receives;" this is a state of high contemplation not peculiar only to religious mystics—a truth appearing suddenly in its entirety and manifesting itself as such, without any of the tedious processes of logical demonstration.

The fifth stopping-place, the "prayer of union, is the beginning of ecstasy; but it is instable. This is the "glimpse of the divine spouse," but without lasting possession. "The flowers only half-opened their calix, have given forth only their first perfume." The fixedness of consciousness, is not yet complete; it has oscillations and lapses; it cannot yet maintain itself for any time in this extraordinary and unnatural state.

At last it attains ecstasy in the seventh stopping-place through the "prayer of rapture." "The body grows cold, speech and respiration are suspended, the eyes close, the slightest movement requires the greatest effort. The senses and the faculties remain without. . . . Though usually one does not lose feeling [consciousness], *it has happened to me to be totally deprived of it;* this has happened but seldom and has lasted but a short time. More frequently feeling continues, but one experiences an indefinable trouble, and though one cannot act externally, one does not cease to hear. It is as it were a confused sound coming from afar. *And even this manner of hearing ceases when the rapture is in its highest degree.*

What then is the seventh and last stopping-place, reached by the "flight of the spirit," what is there beyond ecstasy? Unification with God. This comes about "in a sudden and forceful way. . . . with such power that one would strive in vain to withstand this impetuous leap." God has now come down into the very being of the soul, which becomes one with him. Nor is this distinction between two states of ecstasy in my opinion without ground. In its highest degree, the abolition of consciousness is brought about by its excess of unity. This interpretation seems justified when we reflect upon the two passages which I have given in italics: "It has happened to me to be totally

*"Oraison de *recueillement*," in Spanish, probably, *recoginmineto*—a state of abstraction, in which the mind secludes itself from the outside world. *Translator.*

deprived of feeling" (consciousness); and "This manner of hearing ceases when the rapture is in its highest degree." Other passages to the same effect might be quoted from the same author. It is noteworthy that in one of her "great raptures" the Deity appeared to her without any form—as a perfectly undefined abstraction—at least she writes thus: "I will therefore say that the Deity is as a diamond of a transparence supremely limpid and much larger than the world."* In this I cannot but see a simple comparison and a literary metaphor. It is the expression of perfect unity in intuition.

This psychological description enables us to follow consciousness little by little up to its uttermost degree of concentration, to absolute monoideism; further, it affords us the answer to a question often raised and which has not been decided except on theoretical considerations: Can a state of uniform consciousness subsist? The testimony of some mystics would seem to justify an answer in the affirmative. True, it is a positive, commonplace truth that consciousness exists only through change. At least ever since Hobbes this has always been held: "Idem sentire semper et non sentire, ad idem recidunt:" but this law is infringed in certain exceptional individuals, but it still retains the discursive form: it differs from very strong attention only in degree. The great mystics alone have, attained absolute monoideism. All men everywhere and at all times have, unwittingly, considered perfect unity of consciousness—ἕνωσις—as the supreme consummation of ecstasy rarely attained. Plotinus obtained this favor only four times in his life, according to Porphyrius, who himself obtained it but once, at the age of 66 years.* At this uttermost point consciousness cannot long persist: so they declare. But this instability which they account for in their own way—by their unworthiness to enjoy such happiness, the impossibility of a finite being becoming infinite, etc.,—is in fact explained by psychological and physiological causes. In ecstasy the consciousness is placed outside of the necessary conditions of its existence, and the nervous elements which are the supports and the agents of this prodigious activity cannot keep it up very long. Then the mystic comes back to earth, becoming "the little donkey that goes his way browsing."

III. The weakening of attention is extreme in mania, which consists in a general and permanent superexcitation of the psychic life. The diffusion is not interior only; it expresses itself continually outwards and is ever expending itself. There is constant agitation, a continual need to speak, to shout, to act violently. The state of consciousness projects itself immediately outwards. "Maniacs" says Griesinger, "may now and then for a very long time keep up an expenditure of muscular force that a man in sound health would be incapable of. For weeks or for months they will go almost without sleep, and the only explanation of their vast expenditure of force would seem to be that in consequence of an anomaly of their muscular sensibility they have no feeling of fatigue." At the same time, sensations, images, ideas, feelings follow one another with such rapidity that they hardly reach the degree of complete consciousness; and often, for the looker-on the tie of association which binds them is not discoverable at all. Said one of them: "It is truly frightful to think of the extreme rapidity with which thoughts succeed one another in the mind." In short, in the mental order they present a disordered flow of images and ideas; in the motor order, a flow of words, cries, gestures, and impetuous movements.

We need not delay here to show that all the conditions that are opposite to the state of attention are found

* 'Autobiography,' p. 526.

†Porphyrius, "Life of Peotinus," Chap. XXII.

combined in mania. Neither concentration nor adaptation nor duration is possible. This is the triumph of cerebral automatism left to itself and freed from all control. So too there is sometimes in the subjects of mania an extreme exaltation of memory: they can recite long poems forgotten years before.

In this intellectual chaos, no state lasts for any time. "But let one act powerfully upon the mind of a maniac, or let an unexpected occurrence arrest his attention, and at once he becomes rational and reason holds its own so long as the impression retains sufficient power to fix his attention."* From this we learn again upon what causes spontaneous attention depends.

We class under the general title of *exhaustion* a pretty numerous group of states in which attention does not rise above a very low degree. Not because it has to struggle against an excessive automatism, as is the case in mania; its weakness comes from itself. We find instances among hysterical subjects, among melancholics, in the beginning of intoxication, at the onset of sleep, and in extreme fatigue, whether physical or mental. Children afflicted with chorea are also but little capable of attention.

These morbid or semi-morbid states confirm the thesis already laid down when we studied the normal state —that the mechanism of attention is essentially motor. In exhaustion there is impossibility or extreme difficulty of fixing the attention. The meaning of this, I repeat, is, that an intellectual state cannot predominate nor last, nor produce a sufficient adaptation. This cerebral exhaustion, which results from some fault of nutrition, manifests itself in two ways: first, by a state of consciousness without intensity and without duration; then, by an insufficiency of motor nerve influx. If the movements which, are said to "accompany" attention—those of respiration, circulation, of the head, the members, etc., are feeble; if all these motor phenomena are, as we maintain, not concomitants but elements, integral parts of attention which give to the intellectual state a delimitation, a support, a body, so to speak; if their effect, in the normal state, is to reinforce sensation, image, or idea; then clearly these conditions are here absent or deficient and there can be at most only feeble and unsustained attempts at attention; this is what actually occurs.

Take the case of intoxication—the simplest and commonest case of all, and which has this advantage, that here we can observe the disordering of the movements to the end. It is a familiar biological law that dissolution follows the reverse order of evolution—that is destructive work proceeds from the complex to the simple from the less to the more automatic. This is verified in intoxication. First to be affected are the more delicate movements, those of speech, which becomes embarrassed, of the fingers, which lose their precision; later, the semi-automatic movements which constitute walking—the body reels; still later, the drunken man cannot even retain the sitting posture, and falls to the floor; finally, there is loss of the reflex actions, and the man is dead drunk; beyond this point, there is loss of the respiratory movements. Dismissing the latter phases of the process, which are purely physiological, let us go back to the beginning and consider what takes place in the consciousness. The power of inhibition grows weak; one speaks without reserve: "in vino veritas." Then little by little the consciousness becomes clouded, wavering, indefinite. Thus, the weakening of attention and that of the movements go together: they are two aspects of a phenomenon that at bottom is one.

Yet another question arises, which we do not mean to treat here; we will simply point it out to the reader. If the state of nerve exhaustion pre-

*Esquirol, "Maladies Mentales," Vol. II., p. 47.

vents attention, that fact is an indication as to the source of that power. A man in sound health is capable of attention, effort, work in the widest sense; a man whose strength is reduced is incapable of attention, of effort, of work. But work done is not *e nihilo*; it cannot be anything else but a transformation of pre-existing energy, a change of reserve force into actual work. This reserve force, stored in the nerve substance, is itself the effect of chemic action going on therein. Such then is the ultimate condition of attention.*

According to the generally accepted theory, sleep, too, is the result of exhaustion, and of a sort of intoxication. The very few authors who have studied attention in sleep start from the hypothesis, implicitly or explicitly held, that it is a power, a faculty, and the question they raise is whether the faculty is suspended. The question for us is whether in dreaming this *state* of relative monoideism is produced.

It is certain that often a sensation, an image becomes predominant in the series of states of consciousness which in dreaming flits swiftly and in disorder through the mind. Then comes a moment of inhibition; we even are sensible of at least a partial, temporary adaptation; finally, the predominant state is always accompanied by some strong affection or emotion—fear, anger, love, curiosity, etc.—so that we find all the essential characters of spontaneous attention.

Are there also equivalents of voluntary, artificial attention? First of all we have to exclude an entire class of cases that one might be tempted to regard as affirmative instances,—as solutions of problems, scientific discoveries, artistic or mechanic inventions, ingenious combinations suggested in dreaming. Tartini, Condorcet, Voltaire, Franklin, Burdach, Coleridge, and many others have put on record personal observations, and these are so well known that I have simply to refer to them. But all this is the result of cerebral automatism, i. e., of a sort of activity that is completely antagonistic to voluntary attention. One discovers, invents, solves problems only according to one's mental habitudes. Coleridge composes a poem, but does not work out problems in algebra; Tartini composes his Sonata, but does not invent a financial scheme. In every case there is first a long period of brooding, sometimes conscious, usually unconscious—i. e., purely cerebral—which suddenly reaches its term, and the idea, invention, solution, is evolved. The mental state in dreaming is as unfavorable as it well can be to the constituting of voluntary attention; for on the one hand there is the rapidity and the incoherence of the associations, and on the other hand the disappearance or extreme impairment of coordination. The highest, most delicate, and most complex forms disappear first. Still the will power is not always suspended, for sometimes we strive to keep in a state that pleases us, or to quit a situation that is disagreeable. There are cases which present at least some of the elements of voluntary attention—as is quite natural in those who have acquired that habit. Sometimes the absurdity of a dream strikes us, and we proceed to note them for ourselves; for instance, we make calculations so palpably inexact that we set about discovering the sources of error.* But this is the exception. If sleep were not a suspension of effort in one of its most exacting forms, it would not be separative.

As regards natural somnambulism and still more as regards hypnotism, the question is still full of obscurity. Braid, who first freed artificial somnambulism from the atmosphere of the marvelous that surrounded it, reduced the whole psychology of this phenomenon to "concentration of attention," and the same view, with

*See further remarks upon this point in the concluding chapter, § 2.

*See instances in Sully, "Illusions," Chapt. vii. (Humboldt Library, Nos. 56, 57.)

some difference, has been held by Carpenter, Heidenhain, Schneider, and in particular by Beard. According to Beard, somnambulism is a functional disorder of the nervous system, in which the activity of the nervous system is concentrated in a limited region of the brain, the rest being inactive, so producing loss of volition. He used to compare the brain rind to a gas candelabrum with many jets, when these are all lighted, we have wakefulness; when they are turned down low, but not quite put out, we have sleep; when all are put out save one, and that burns full, using all the gas, we have hypnosis in its several degrees. This theory of "concentrated attention" has been criticised a good deal,* and it seems to be hardly applicable to all cases. Can the hypnotism produced in fowls and crayfishes by Father Kircher, Czermak, and Preyer, be attributed to abnormal concentration of attention? True, the hypnotized subject is well prepared for monoideism but is this state, artificially produced by suggestion, to be compared to attention properly so called? Is it not rather like the fixed idea?

IV. Idiocy is of many degrees ranging from entire nullity of intelligence to simple weak-mindedness, according to the point at which the arrest of development took place. Some imbeciles have even a special talent, as for mechanic arts, drawing, music, reckoning, all the more striking because all around it is vacuum. These isolated faculties have been likened to the instincts of animals.

The most elementary conditions of attention are wanting or appear only by flashes. The defective senses transmit only dull impressions. The higher centers are unfitted to elaborate these or to connect them. The state of the *motor* power, that essential factor of attention, calls for special notice. It always presents anomalies—paralysis, convulsions, contractures, epilepsy, or a narrow automatism which keeps ever repeating the same movements, for instance, continually swaying the body in accompaniment of a monotonous singsong, beating the walls, etc. There is no power of coördination or control. "Imbeciles, idiots," says Esquirol, "are without the faculty of attention, and this renders them incapable of education: this observation I have made again and again in studying them. Wishing to take plaster casts of a great number of persons affected by mental disease, I succeeded with the victims of mania, even wild maniacs, and with melancholics; but I never could get the imbeciles to keep the eyes shut long enough for the plaster to spread over them, however willing they might be to have the operation performed. I have even seen them cry because the cast could not be taken; and they would try again and again, but in vain to keep the pose given them: they could not keep the eyes shut for more than a minute or two."* The lowest grade of imbeciles do not even possess the spontaneous attention of animals for their own preservation. The less refactory cases afford some small opportunity for education. Séguin and others have by patient training obtained some results. Without inquiring whether the great efforts made to this end during the past 50 years are of any sociological value, and whether the labor might not have been more usefully bestowed, we see that the different systems of education all aim at establishing some few dominant, regulating states, that is, a sort of attention. The instructor begins with acts of great simplicity. Thus, in certain asylums in the United States, in order to awaken attention in idiots, they are taught to put pegs in holes, to repeat a tune, to associate words with certain figures, etc.†

*See J. Stanley Hall, in "Mind," April, 1885; Gurney, ibid., Oct., 1884.

*Esquirol, "Maladies Mentales," vol. I., p. 11.

†Séguin, "Traité de l'Éducation des Idiots," Paris, 1846; Ireland, "Mental Idiocy."

To sum up, attention is an attitude of the mind—a *formal* state I should call it but for the misuse of the term. We might represent graphically the totality of its manifestations, whether normal or morbid, by a right line bifurcating at both extremities. In the middle stands mean spontaneous attention. Following our imaginary line to the right (in the direction of increasing intensity) we have strong spontaneous attention, then preoccupation. next the fixed idea in its weak state, The line now bifurcates, to represent the two extreme degrees—the fixed idea, and ecstasy. Again we go back to the starting-point, and follow the line to the left—in the direction of diminishing intensity. We have voluntary attention, first in the form of an organized habit, then in its mean form, next vacillating, lastly a bifurcation answering to the two extremes of temporary failure of attention on the one hand, and impossibility of attention on the other. Between the several forms are shades of difference here overlooked, but we thus see a community of origin and a oneness of composition in all these states.

CHAPTER V.

CONCLUSION.

I. We have endeavored to show that attention, in all its forms, has for its immediate and necessary condition interest, that is, affective states natural or artificial, and that its mechanism is motor. It is not a faculty, a special power, but an *intellectual state* that becomes dominant owing to certain complex causes which produce a longer or shorter adaptation. We have dwelt sufficiently upon the rôle of the movements, and to them we need not return; but it will be well to study for a moment those affective states which awaken or which sustain attention. So far we have simply shown their function, and have said nothing of their nature.

It is not proposed to present to the reader, in passing, and as an episode, a psychology of feelings. I simply intend to show that inasmuch as attention always depends upon affective states, it necessarily implies motor elements. Thus will our principal thesis be justified once again and in another way.

First we must put away the generally accepted belief that the groundwork of the affective life consists in pleasure and pain. Pleasure and pain are but effects, results, tokens, signs, which show that certain appetites, inclinations, tendencies, are satisfied, or not satisfied. They represent only the superficial, ultimate form of the phenomenon—the only one that enters consciousness. They are the hands of the clock, not its works. The true causes of the affective life are to be found deeper—in the inmost nature of the organism. The feelings, emotions, passions have their primal source in the vegetative life. Whatever comes from the heart, the vessels, the digestive, respiratory, or sexual organs, in a word, from all the viscera, that constitutes the *prima materies* of sensibility, just as whatever comes from the external senses is *prima materies* of the intelligence. And just as, physiologically speaking, the vegetative life precedes the animal life, which is based upon it, so, psychologically speaking, the affective life precedes the intellective life, which rests upon it. The states which we call wants, appetites, inclinations, tendencies, desires, are the direct, immediate results of the organization of each animal. They constitute the true groundwork of the affective life. We say with Spinoza: "Appetite is the very essence of man. . . . Desire is appetite with self-consciousness. . . . From this it follows that the basis of effort, will, appetite, desire is not the fact that one has judged that a thing is good; but on the contrary

we judge a thing to be good *because* we are inclined to it by effort, will, appetite, desire." Primarily, pleasure is not sought for its own sake, nor pain for its own sake shunned, for plainly one does not seek nor shun what one does not know. It is only the animal that is capable of experience, that is, of memory and of reflection, that can seek or shun for their own sake states agreeable or disagreeable already experienced. Hence those psychologists—and many they be—who define sensibility as "the faculty of experiencing pleasure and pain," and who consequently regard these two phenomena as the essential characters, do not go back to the true origin of the affective life. To define not by the effects but by the cause, we should have to say that sensibility is "the faculty of desiring, and *consequently* of experiencing, pleasure and pain."* Much rather are these wants, appetites, desires (for brevity sake we will henceforth call them simply tendencies) themselves effects of the organization: the immediate expression of its modes of being, whether permanent or transient.

It is needless to bring together here facts and arguments in order to show that pleasure and pain depend upon tendencies, which in turn depend upon the organism. A brief excursion into the pathology of the affective states will suffice. We shall see that agreeable and disagreeable vary precisely as the tendencies. Where the normal man, with normal inclinations shall find pleasure, there the abnormal man, with abnormal inclinations, will find pain and *vice versa*. Pleasure and pain follow tendency as the shadow follows the body.

Let us begin with the tendencies connected with the fundamental function—nutrition. Every one has heard of the "longings" of pregnancy. In consequence of very imperfect nutrition during the first months, there come disorders of the digestive, circulatory, and, secretory systems, which are expressed by whimsical longings and perverted tastes. The woman will eat clay, straw, tobacco, tallow. The same tendencies are seen in hysterical, chlorotic, and neuropathic persons. The beginning of insanity is sometimes marked by similar dietary eccentricities—thus a person will show a disposition to eat spiders, toads, worms. Lower still we find "coprophagy" and "scatophagy." A patient had to be watched, to prevent him from swallowing the contents of a cuspidor in a hospital ward*. And there is a like perversion of the sense of smell. Some neuropathic subjects find the oder of roses disagreeable but have a liking for that of valerian or of asafetida.

Is there any need to treat at length of the deviations and perversions of the sexual instinct? Even after due allowance has been made for imitation and debauch, for that which comes from the head, (the imagination), rather than from the senses, there still remains a plentiful harvest. The same couclusion always forces itself upon us; Change the organism and you change the tendencies, you change the position of pleasure and pain; hence these are but indicative phenomena, signs betokening that the needs of the organism, of whatever kind, are satisfied or countered.

Should it appear that the inclinations just enumerated are of too strictly physiological a kind, I can cite the group of irresistible impulsions—the insuperable desire to drink, to rob, to set fire, to kill, to suicide. So far as consciousness is concerned, these impulsions are causeless and without any reasonable motive, since their true cause and the conditions of their genesis, lie below it, and consciousness knows only the result of this unconscious work. These irresistible wants are produced in widely dissimilar forms. Those which are most frivolous are

*I employ their terminology though I do not myself accept it.

*Campbell, in the "Journal of Mental Science," July, 1886.

as instructive for psychology as those which are most forceful. Thus, a very inoffensive form of insanity indeed is "onomatomania." The search for the name of some unknown person, seen sometime by chance in a newspaper, takes up the whole mind of a patient, depriving him of sleep, and worrying him continually. How many names do we all forget, and never bestow a thought on them! But the subject of "onomatomania" has no rest till he recalls a name. When he does recall it, he is happy. So, whenever any irresistible impulsion whatsoever—to theft, to murder, etc.—is carried out, there follows a feeling of satisfaction.

These morbid manifestations have been closely studied in our time. They are regarded as symptoms of one single cause—degenerescence. Hence we always find the self-same series of cause and effect: anomaly in the organism—anomaly in the tendencies that express it—anomaly in the position of pleasure and pain.

So much being agreed, namely, that the essense of affective life consists in tendencies, whether conscious or not (and here consciousness acts only a subordinate part), how shall we represent these tendencies? The only positive notion that we can have of them is formed by considering them as movements (or inhibitions of movements) whether actual or nascent. Thus they take their place among motor phenomena: in other words, a want, an inclination, a desire always imply a *motor innervation* is one degree or another.

The carnivore that has seized its prey and is rending it with tooth and claw, has attained its object and satisfied its tendencies by the aid of a considerable expenditure of motor power. Suppose it does not yet hold its victim, but sees it and is watching its chance to seize it, then its whole organism is in a high state of tension; the movements are not executed, but on the slightest impulsion they are set in action. But suppose the animal is only prowling, seeking by sight and scent some prey that chance may offer: in that case there is a state of half-tension, and the motor innervation is far less strong, and but vaguely adapted. Finally, in a state still tension, the animal lies in its lair: the undefined image of prey, i. e. the memory of the animals it has before captured, passes through its mind: the motor element has very little intensity, is but nascent, and is not expressed by any visible movement. Between these four degrees there is certainly a continuity, and throughour the whole series there is a motor element, differing between one and another only in quantity.

The illustration is coarsely drawn on purpose, in order to make the matter clear. We might quite as well have taken love, aversion or fear, starting with their more pronounced motor manifestations, then exhibiting in succession their less pronounced degrees, finally reducing them to their purely interior state, which is only a very faint motor innervation—a movement in the motor state.

Thus a tendency is associated always with a physiological phenomenon which gives it a physical basis. It is no longer a "state of the soul," a mysterious, transcendental character. Tendencies, inclinations, desires, these terms and their synonyms signify a movement, nascent or aborted accordingly as it is fitted to be evolved to its uttermost limit, or as it is destined to undergo an arrest of development. Whether the concomitant state of consciousness appears or disappears, whether the tendency is conscious or unconscious, motor innervation in any event is ever the fundamental element.

The conclusion we reach therefore is, that attention depends on affective states, affective states are reducible to tendencies, tendencies are at bottom movements (or arrest of movement) whether conscious or unconscious. Hence, attention, spontaneous

or voluntary, is from its beginning connected with motor conditions.

II. It now remains for us to consider briefly the general physical conditions of attention.

If we observe men as they are, taken in mass, not persons of trained and cultivated minds, as psychologists nearly always do, it will be readily seen that spontaneous, and above all voluntary attention are exceptional states. Eliminate first the routine of life—that vast mass of habits which make us act like automatons, with vague and intermittent states of consciousness. Eliminate those periods of our mental life in which we are passive, because the order and succession of our states of consciousness come to us from without and the series of states is imposed upon us—as in reading a book of average interest, or in performing some manual or other work presupposing a succession of acts in a set order. Eliminate that state of relative mental repose wherein one is "thinking of nothing," that is wherein the states of consciousness have neither intensity nor clear definition—as reverie in all its degrees. Eliminate states of passion and strong agitation with their irregular fluctuations and their diffusion of movements. These and perhaps a few other states being eliminated, what remains may be credited to the general account of attention. And in this general account the cases of spontaneous attention constitute the great majority of the entries while the clean and indisputable cases of voluntary attention are few —with many men and women, indeed, they hardly amount to anything. We have tried to give the psychological reasons of this. But we have also noted incidentally the familiar fact that in a state of fatigue, exhaustion, attention is very difficult, often impossible, never lasting. The reason is, that attention demands a larger expenditure of physical force than any other intellectual state, and that under special conditions.

Be it remarked once again that attention cannot exist save by a narrowing of the field of consciousness —which is the same as to say that *physically* it presupposes the calling into action a limited portion of the brain. It matters not whether we regard this portion as a localized region, or—a more probable supposition—whether we consider it to be formed of various elements diffused through the mass of the encephalon and working in concert, to the exclusion of others. The normal state of consciousness implies diffusion with distribution of working throughout the brain: attention implies concentration, with localization of the work of the brain, when the brain passes from the normal state to the state of strong attention, we have the analogue of what takes place when, instead of bearing a weight upon our shoulders we sustain it with one finger. This labor all imposed upon a part of the brain can be performed only by rapid transformation of potential energy or reserve energy into actual. All physiological work results from chemic action in the organism, and this chemic action has its rise in the food and the oxygen that enter the system. This production of work, resulting from nutrition, is by no means constant. Among those of feeble constitution the reserve work must needs be lacking, and hence exhaustion quickly supervenes. Even in persons of the most vigorous constitution, the accumulated capital is quickly spent, if the attention is strong and long continued. Hence it would seem that the last physical condition required by attention consists in what physiologists call "dynamogeny," which is defined by Brown Séquard as "the power possessed by certain portions of the nervous system suddenly to call forth an increase of activity by a purely dynamic influence." Dr. Brown-Séquard reports the case of a young girl who, every Sunday at the ringing of the church bells, fell into an ecstasy and stood for twelve hours on the sloping edge

of her bed, supported only by the toes and a very small part of the soles of the feet. Three strong electro-magnetic shocks were powerless to affect her state immobility. The remainder of the week she remained in bed, exhausted and almost unable to stir. To perform this *tour de force* during half a day continuously, she had to develop an enormous power of action in the motor apparatus. It is not probable that cases of extraordinary and protracted attention presuppose in certain portions of the nervous system a like super-activity, and that this too is followed by a period of fatigue and powerlessness? But dynamogeny is a physiological state the causes of which are so little known, that it were useless to draw psychological deductions from it.

It is to be noted that the forgoing remarks apply strictly only to the *physical* conditions of attention. The terms *work*, and *transformation of energy* have a value and meaning only in the order of physical phenomena: the state of consciousness, the interior happening (whatever idea we may form of it) is incommensurable with these. The "psychic force" spoken of by certain authors, is only a metaphor, unless by it you mean the physical conditions of a state of consciousness and these only. Hence to maintain that strong attention depends upon the possibility of a transformation of potential energy into actual, is simply to point out one of its fundamental material conditions, and nothing more.

Many practical consequences might be pointed out in concluding this study of attention. I will not attempt that task. My one object was to analyze the mechanism of attention—a subject which I had nowhere seen treated in such a way as its importance seemed to demand. This I have endeavored to do in accordance with the theory of evolution, showing that voluntary attention is but a higher, extreme form, resulting from lower forms by processes half-unconscious, half-conscious.

THE END.

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